

THE IRON AGE *Contents*

JANUARY 26, 1939

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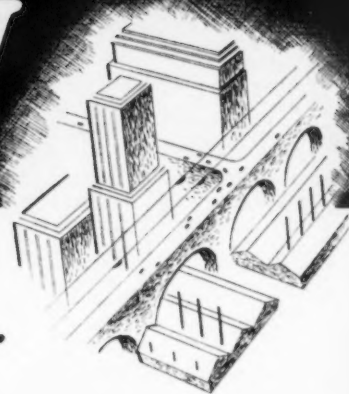
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JANUARY 26, 1939

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The Treasure Hunters

THIS little piece is being written to the accompaniment of influenza. That has its drawbacks, of course, but on the other hand some advantages, too. When the clinical thermometer begins to climb, it is surprising how many bright ideas pop into one's head. The trouble is that they pop in and out so fast that it's hard to pin any of them down.

I suppose it was because of my having to break a speaking engagement in Columbus, Ohio, that the treasure hunters came to my bedside. Columbus, of course, was the world's greatest treasure hunter, for who could put a price on the Western Hemisphere? In imagination I could see Columbus reincarnated 450 years after his historic voyage. Brought back to Genoa from wherever he might be in the spirit world and put on a modern steamship with a ticket for New York. How amazed Columbus would be after he had toured the Americas. It would be hard to convince him that this was the continent that he had discovered scarcely four and a half centuries ago. Or that his simple pioneering efforts had multiplied so magnificently.

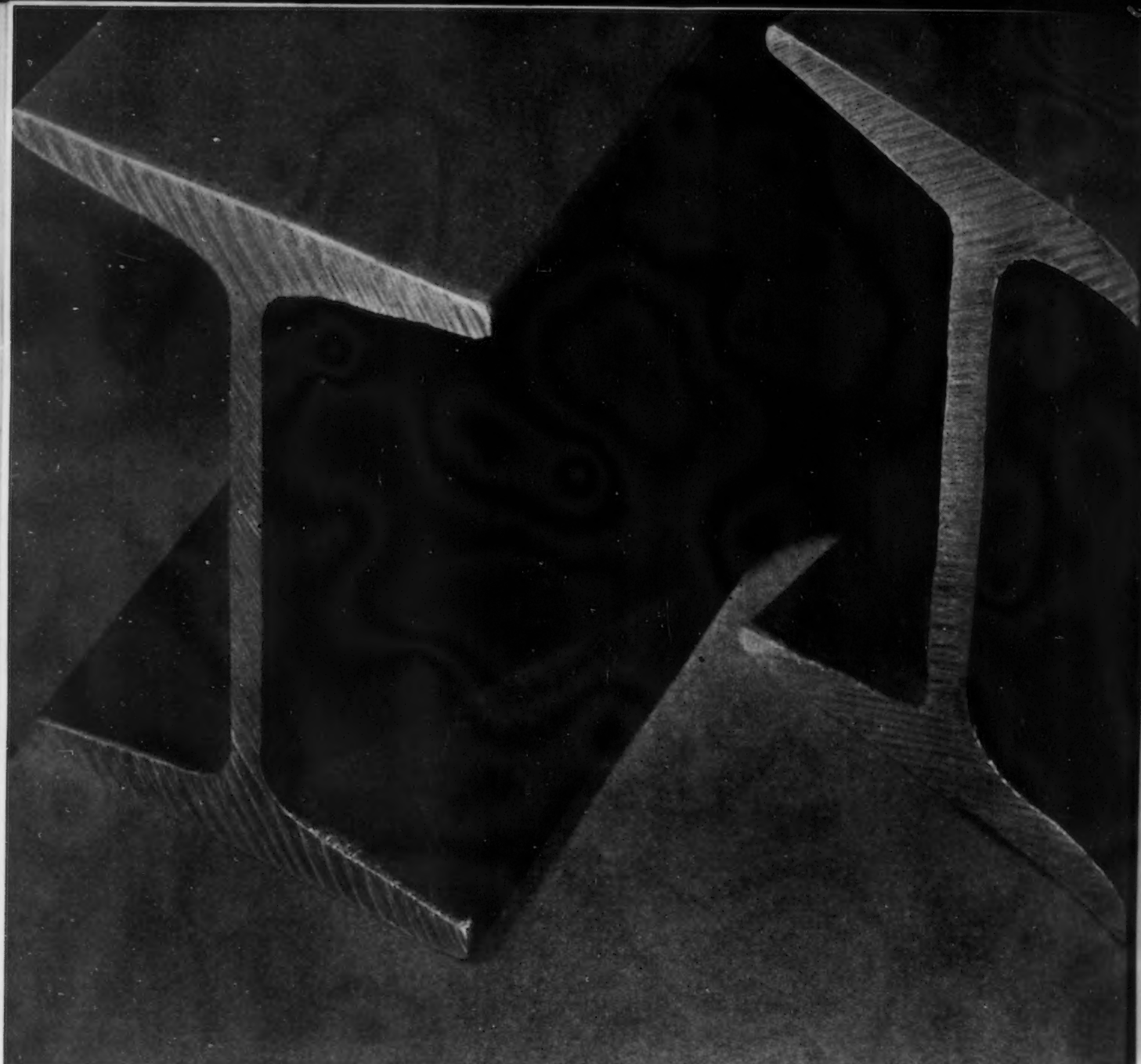
No wonder, perhaps, that to hunt for treasure has been a most appealing and fascinating occupation of mankind since the dawn of history. And no wonder that the jaded appetites of modern "society" adolescents are stimulated by artificial treasure hunts organized to give them vicariously the thrills of discovery and conquest which their hardier grandfathers earned at first hand.

Inventors, scientists, managers of productive enterprise and others with similar creative ability will always continue to earn that thrill at first hand. For it is through their efforts, aided by the clues of imagination and ideas, that whatever we have has been traced to its hiding place.

When Columbus first came, most of what we have today was hidden in the earth or upon it—buildings, bridges, metals, machinery, all of the marvels of production, transportation and communication. They were there, but the treasure hunters had not found them.

What wonders of the future must still await our treasure hunters in this rich storehouse of hidden things?

J. H. Van Derveer



Saving Weight and Fabrication Costs

The many uses of structural steel in equipment as well as in building construction offer numerous opportunities for the services of the Inland engineer to prove of real value.

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Metal Cleaning and Finishing

Economics

SO widely divergent are the methods in common use to clean and finish metal products in various industrial plants throughout the country, that the cost of accomplishing substantially the same result in any two plants may vary by as much as 1000 per cent. This may be the direct outcome of a habit of treating the subject as a "necessary evil"; as something which, unfortunately, has to be done whether one wishes it or not. As a consequence, management has frequently adopted the attitude of "Well, let's get it done somehow or other, and move on to more important things."

The past decade, with its intensified competition for existence, has had the effect of developing a more rea-

By FRANCIS JURASCHEK
Consulting Editor, *The Iron Age*

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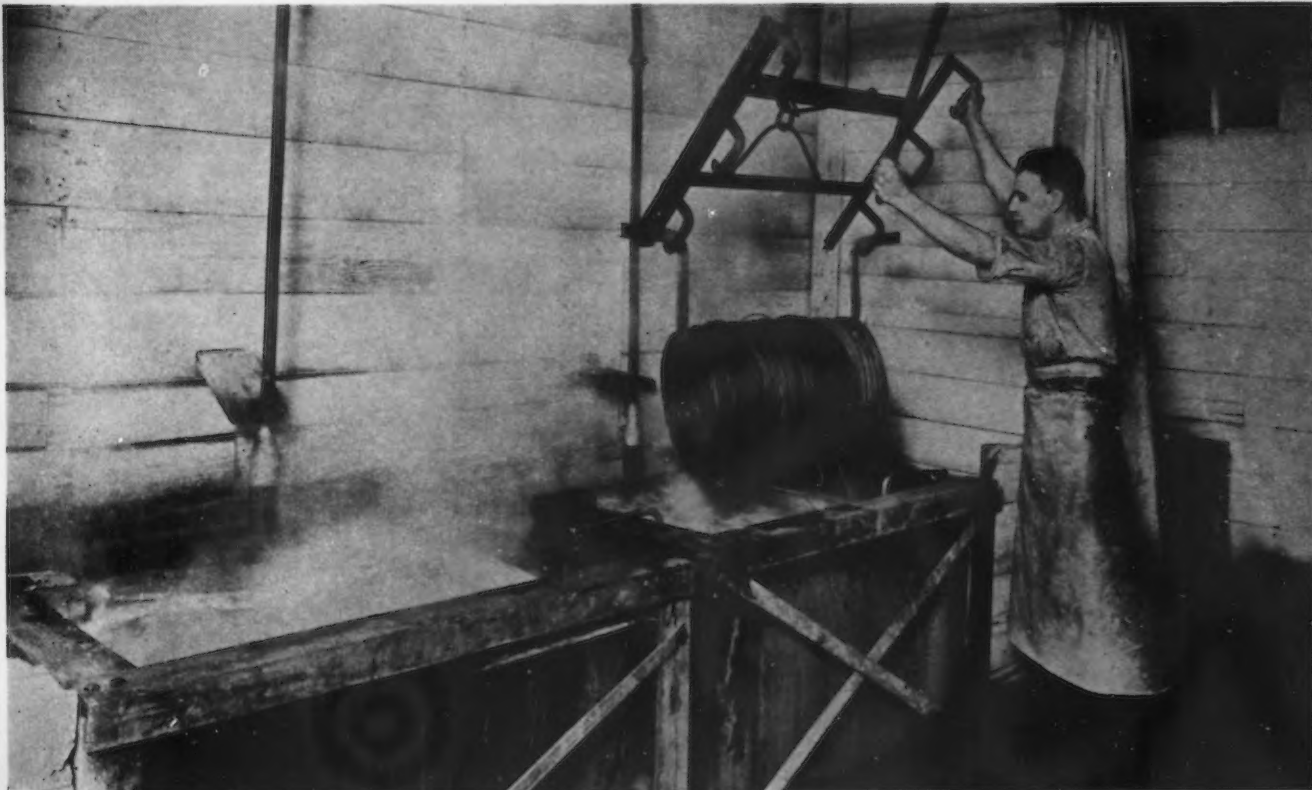
sonable viewpoint. Instead of regarding every cleaning operation, for instance, as a necessary evil to be tolerated (and avoided if possible), management has started to look at the whole matter from the standpoint of the results accomplished. And the far end of the chain has become the most important link; "What is the

o o o

FIG. 1—Coils of wire being dipped into hot caustic solution for thorough cleaning after being annealed. (Courtesy Continental Diamond Fibre Co.)

effect on the sales appeal of the product?" In fact, one of the big steel companies has recently emphasized this idea very succinctly in the headline of an advertisement: "Where the Finish Is the Start of the Sale."

This is the primary idea which has been responsible for an enormous amount of recent research in the fields of the cleaning and finishing of metal products. Now, research generally starts with the question *Why?* followed by two other questions, *What?* and *How?* In line with this procedure the research into metal cleaning and finishing started to find out exactly why metals should be cleaned and finished; thereby assembling a fund of positive knowledge to take the place of haphazard opinions. The



trail led into the wildernesses of physics and chemistry just as soon as *What? and How?* began to be analyzed. Through the morasses of colloidal solutions and the heights of ionization, from the jungles of abrasives to the shores of heat-treatment,

various authorities will present the results of their experience in this research. During the past four years upwards of a hundred articles have been published in *THE IRON AGE*, descriptive of metal cleaning and finishing *methods*. In the new series these

economic advantages of the various methods available.

A Bird's Eye View

Solely, therefore, for the purpose of providing a basis for the discussion of the economic values of methods, the accompanying chart has been prepared. It gives a bird's eye view of the whole subject. This "Guide to the Cleaning and Finishing of Metals" makes no pretensions to completeness. It does, however, assemble in one place the principal factors of the whole art of metal cleaning and finishing, and it does somewhat loosely show the relations between these factors. It is merely a starting point from which the economic discussions may flow, but it has the advantage of presenting a simple and readily understandable classification of the methods—factors involved in preparing metal products for sale and use.

There is no sharp dividing line between *cleaning* and *finishing*. Any piece of metal may be made mechanically clean by draining off surplus oil or grease, and wiping or brushing, or tumbling in a barrel with or without sawdust. It may then be ready for use without further finishing. Or it may be made chemically clean by thorough washing in various solutions, or by electrolytic action. Such cleaning may be all the finishing required. Or, it may be cleaned and polished, or cleaned, coated and polished, or passed through these or some of these operations and a final finish applied by paint, lacquer, enamel, etc. Literally hundreds of these combinations of various steps are possible in the way of producing a commercially desirable *finished* product. How many of them and which of them are desirable in any particular case is the economic problem.

PRE-CLEANING is a step which is deservedly receiving more attention today as a means of cutting the costs of cleaning proper. It is designed to remove as much of the surface oil and grease (and combined dirt) as may be economically possible *before* any really expensive cleaning operations proper are used. Sometimes the pre-cleaning methods listed are sufficient in themselves, but as a general rule this is not considered so today.

CLEANING is designed to remove thoroughly the surface film of oil or grease and dirt, preparatory to some actual finishing operation. Sometimes, as has been said, no further finishing is needed.

DESCALING is designed to remove



FIG. 2—All kinds, shapes and sizes of metal products designed for consumer use must be cleaned and polished, and frequently treated with some applied finish. (Courtesy Magnus Chemical Co.)

hundreds of bright young men have been toiling. And their labors have revealed some very curious problems in production economics.

This article is designed simply as a general introduction to a new series on the *economics* of metal cleaning and finishing. In this new series,

and other, newer methods will be summarized in terms of their economic values. *What? and How?* will be subordinated to *Why?* In brief, since the "necessary evil" phase is giving way to the realization of the sales advantages to be gained, the moot question today is one of the

I—PRE-CLEANING

Purposes

To remove as much of the surface dirt and grease as possible before expensive cleaning operations are used, or for the sake of appearance for customers who buy unfinished metals.

Methods

- 1—Draining
- 2—Centrifuging
- 3—Scrubbing
- 4—Hydraulic Spraying
- 5—Steam-gun Spraying
- 6—Dipping in Solvent
- 7—Compressed Air Blasting
- 8—Light Sand Blasting
- 9—Tumbling with Sawdust
- 10—Tumbling without Sawdust
- 12—Snagging (on foundry work)

Equipment

Tanks, trays, holders, baskets, hooks, brushes, solvents, pumps, compressors, hose, air-guns, blasting equipment, masks, tumbling barrels, chippers, sand, shot, sawdust, waste, rags, etc.

II—CLEANING

Purposes

To remove the surface film of oil or grease thoroughly, preparatory to finishing operations, or for the sake of appearance for customers who buy unfinished metals.

Methods

- 1—Wiping (by hand or brush machine)
- 2—Brushing (hand or machine)
- 3—Sand Blasting
- 4—Tumbling
- 5—Hydraulic Spraying
- 6—Steam-gun Spraying
- 7—Dipping in Still Tank
- 8—Mechanical Washing
- 9—Electric Cleaning (anodic and cathodic)
- 10—Continuous Acid or Alkali Dip
- 11—Vapor Degreasing (as with trichlorethylene)
- 12—Volatile Degreasing (as with carbon tetrachloride)

Equipment

Waste, rags, brushes, steam-guns, hose, pumps, compressors, tanks, trays, baskets, hooks, washing machines, cleaning compounds, vapor and volatile compounds, heaters, cabinets, electrolytic equipment, motor-generator sets, etc.

III—DESCALING

Purposes

To remove oxides of iron, steel, and other metals appearing on the surface of the metal, or to remove scale formations caused by heating.

Methods

- 1—By frictional abrasion
 - a. Sand or Shot Blasting
 - 1—Gun
 - 2—Rotary Table
 - 3—Blasting Barrel
 - 4—Centrifugal Blast
 - b. Scratch Brushing
 - c. Hand Rubbing
 - d. Tumbling
 - e. Chipping
- 2—By chemical separation
 - a. Pickling, to remove
 - 1—Brown Rust
 - 2—Blue Scale
 - 3—Black Scale
 - b. Deplating or stripping
- 3—By electrochemical separation
 - a. Pickling, as above
 - b. Deplating or stripping

Equipment

Blasting equipment, sand, shot, tumbling barrels, tanks, pickling solutions, electrochemical equipment, etc.

A Guide to the Cleaning

III—DESCALING

Purposes

To remove oxides of iron, sulphides of copper, etc., appearing on the surface of the metal as hard, irregular formations caused by heating.

Methods

- 1—By frictional abrasion
 - a. Sand or Shot Blasting
 - 1—Gun
 - 2—Rotary Table
 - 3—Blasting Barrel
 - 4—Centrifugal Blast
 - b. Scratch Brushing
 - c. Hand Rubbing
 - d. Tumbling
 - e. Chipping
- 2—By chemical separation
 - a. Pickling, to remove
 - 1—Brown Rust
 - 2—Blue Scale
 - 3—Black Scale
 - b. Deplating or stripping
- 3—By electrochemical separation
 - a. Pickling, as above
 - b. Deplating or stripping

Equipment

Blasting equipment, sand, shot, brushes, files, chippers, tumbling barrels, tanks, pickling solutions, electrolytic solutions, electrochemical equipment, motor-generator sets, etc.

IV—PRIMARY POLISHING

Purposes

To obtain a smooth surface in preparation for coating, plating, painting, etc.

Methods

- 1—Tumbling, to remove skin or fins
- 2—Rolling, to remove flash or edges
- 3—Abrasive Wheel Grinding
- 4—Polishing, to brighten the surface
- 5—Belt Polishing, to smooth surfaces

Equipment

Tumbling, rolling and burnishing barrels, polishing wheels and belts, abrasives of varying degrees of coarseness, rouges, etc.

anining and Finishing of Metals — THE IRON AGE

V—BASIC FINISHES

Purposes

To obtain color or smooth surface or both on the natural surface of the metal, or to rustproof the surface, without the use of an applied finish.

Methods

- 1—By mechanical treatment
 - a. Sanding
 - b. Scratch Brushing
 - c. Greaseless Wheel-finishing
 - d. Grinding
 - e. Lapping
 - f. Honing
 - g. Polishing (see Section VII)
 - h. "Superfinishing"
- 2—By heat treatment
 - a. Gun Barrel bluing
 - 1—Heating in sand bath
 - 2—Heating in niter bath
- 3—By chemical treatment
 - a. Bonderizing (zinc phosphate)
 - b. Granodizing (zinc phosphate)
 - c. Parkerizing (iron phosphate)
 - d. Cromodizing (iron chromate)
 - e. Dyeing (of aluminum, etc.)
- 4—By chemical baths
 - a. Acid or Alkali Dips
 - b. Pickling
 - c. Etching
- 5—By electrolytic treatment
 - a. Anodic Oxidation
 - b. Dyeing
- 6—By electrochemical treatment
 - a. Color Plating

Equipment

Heat-treating furnaces, machine tools, tanks, chemical solutions, dyes, electrolytic equipment, motor-generator sets, brushes, holders, trays, baskets, hoists, etc.

VI—METALLIC COATINGS

Purposes

To resist rust or other corrosion, to minimize wear, to provide a base for further finishing, to obtain a pleasing appearance or to build up worn parts.

Methods

- 1—By dipping
 - a. Hot-dip Galvanizing (zinc)
 - b. Hot-dipping in lead, tin, etc.
- 2—By mechanical impregnation
 - a. Sherardizing (zinc dust)
- 3—By vapor coating
 - a. Calorizing (of aluminum)
- 4—By plating
 - a. Electrogalvanizing (acid or cyanide)
 - b. Tin Plating
 - c. Copper Plating (acid or cyanide)
 - d. Brass Plating
 - e. Nickel Plating
 - f. Cadmium Plating
 - g. Chrome Plating
 - h. Aluminum Plating
 - i. Silver Plating
 - j. Gold, etc., Plating
 - k. Iron, Steel and Alloy Plating
- 5—By direct deposition of metal
 - a. Metal Spraying
 - b. Cathode Sputtering
 - c. Vacuum Plating

Equipment

Tanks, trays, baskets, hoists, hooks, electrolytic equipment, motor-generator sets, acid and alkali solutions, heaters, plating metals, cyanide, etc.

VII—P

Pu

To provide better appearance, to facilitate inspection, give an improved finish, increase smoothness, resist rust or corrosion, or provide a surface for further finishing.

M

- 1
- 2
- 3
- 4
- 5
- 6—Barrel Burnishing, for
- 7—Buffing, to produce h
- 8—Sand Blasting
 - a. Sand, for matte fi
 - b. Shot, for peined fi
 - c. Sand-and-shot, for
- 9—Scratch Brushing
- 10—Preparation for certa
 - a. Surface Insulating

Equ

Tumbling, rolling and buffing wheels, abrasives, equipment, compressors, air-hoses, etching solutions, etc.

THE IRON AGE

COATINGS

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ss, electrolytic equip-
and alkali solutions,
etc.

VII—POLISHING

Purposes

To provide better appearance, lessen wear, facilitate inspection, give an impervious surface of mechanical smoothness, resist rust or other corrosion, or prepare the surface for further finishing.

Methods

- 1
- 2
- 3 } See Section IV
- 4 }
- 5 }
- 6—Barrel Burnishing, for lustrous finish
- 7—Buffing, to produce high lustre
- 8—Sand Blasting
 - a. Sand, for matte finish
 - b. Shot, for peined finish
 - c. Sand-and-shot, for silvery finish
- 9—Scratch Brushing
- 10—Preparation for certain applied finishes
 - a. Surface Insulating

Equipment

Tumbling, rolling and burnishing barrels, polishing and buffing wheels, abrasives, rouges, etc., blasting equipment, compressors, air-hose, sand, shot and grits, tanks, etching solutions, etc.

VIII—APPLIED FINISHES

Purposes

To provide color, smooth surface, lustre, or otherwise add to the sales appeal, or to give resistance to rust, corrosion, or wear, or to simulate the appearance of another material.

Methods

- 1—Painting
- 2—Lacquering
- 3—Japanning
- 4—Varnishing
- 5—Enameling with Lacquers
- 6—Enameling with Porcelains
 - a. Clear
 - b. Colored
- 7—Applied Synthetics
- 8—Lithographic Finishes
- 9—Metal Spraying
- 10—Rubber-coating
- 11—Fabric-coating
- 12—Cement-coating
- 13—Injection-molding of Plastics over metal cores

Equipment

Brushes, spray equipment, compressors, air-hose, paints, lacquers, japans, varnishes, enamels, porcelains, cement, rubber, fabric, synthetic finishing materials, tanks, acid solutions, molding presses, etc.

IX—COLOR IN METALS

Purposes

To provide a pleasing appearance or otherwise to add to the sales or use appeals.

Methods

- A—Iron and Steel
 - 1—Heat Treatment
 - 2—Mechanical Treatment
 - 3—Chemical Treatment
 - 4—Alloying
 - 5—Plating
- B—Copper, Brass & Bronze
 - 1—Varying proportions of Alloys
 - 2—Adding Aluminum
 - 3—Electrolysis
 - 4—Chemical Baths
 - 5—Plating
- C—Aluminum
 - 1—Boiling in Lime Solution
 - 2—Chemical Baths
 - 3—Anodizing
 - 4—Dyeing
- D—Cadmium, Lead, Pewter, Silver and Platinum
 - 1—Chemical Baths
 - 2—Plating
- E—Zinc
 - 1—Electrolysis
 - 2—Plating
 - 3—Chemical Baths
 - 4—Cromodizing
 - 5—Alloying
- F—Gold and Other Rare Metals
 - 1—Chemical Baths
 - 2—Plating
- G—Magnesium Alloys
 - 1—Chemical Baths
 - 2—Plating

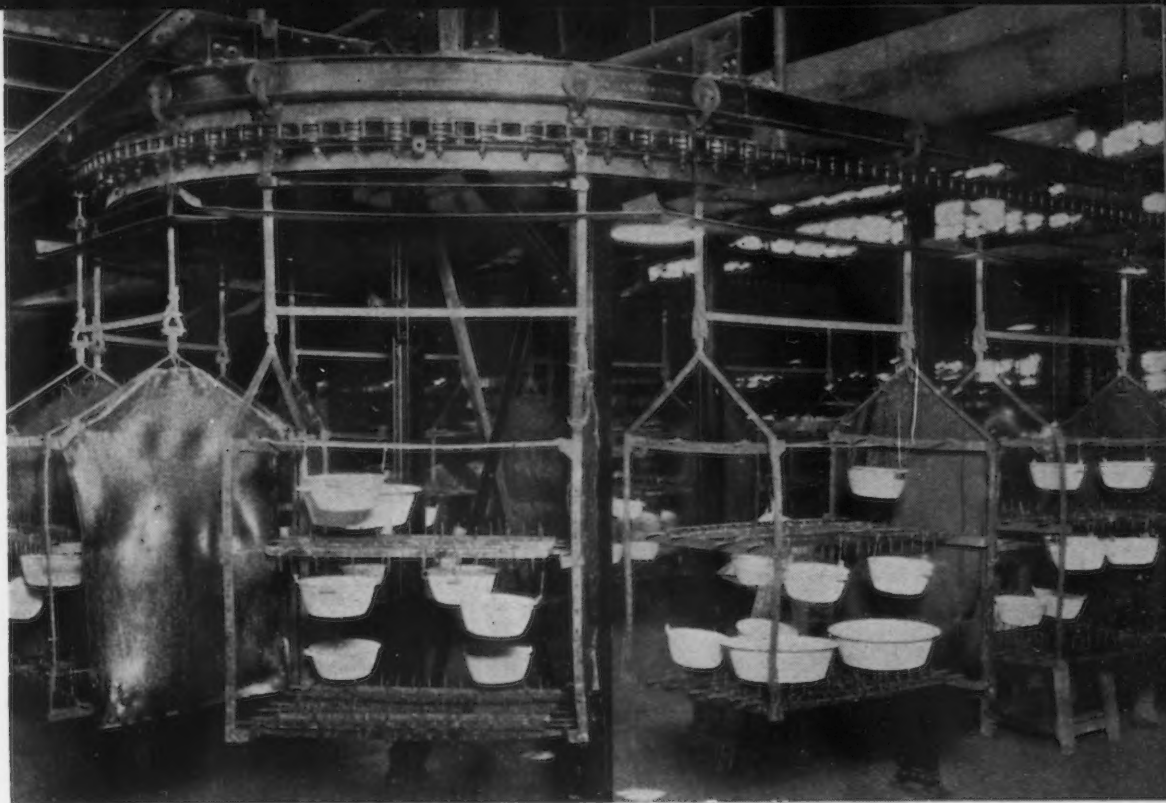
Equipment

(See previous Sections)





FIG. 3—Kitchen-ware drying on a rack conveyor after being enameled. Handling costs often bulk large in finishing operations. (Courtesy Jeffrey Mfg. Co.)



oxides of iron, sulphides of copper, etc., caused usually by heat treatment, and appearing on the surface of the metal as hard, irregular formations which prevent the application of a smooth finish, or which cause excessive wear to cutting and finishing tools, or which cause a future corrosive action underneath the surface of an applied finish.

PRIMARY POLISHING is an operation designed either (1) to give a smooth surface to the metal after it has been made clean, and thus to serve as a final finish, or (2) to give a smooth surface in preparation for coating, plating, painting, etc.

BASIC FINISHES is the general title of a section of the chart descriptive of ways and means to obtain color in metal surfaces without the use of any applied finishes. Here we shall undoubtedly see in the near future the results of a great deal of the research now being carried on. Included here are various methods of rust-proofing or corrosion-proofing which do not depend upon the application of a covering material.

METALLIC COATINGS may be final finishes, but are more generally used as the bases for other finishes. They are primarily designed to resist rust or corrosion, to minimize wear between moving parts, to provide an adequate and lasting base for other finishes, and sometimes to give, in themselves, a pleasing appearance.

POLISHING as listed in Section VII of the chart, is "final" polishing, designed to give a better appearance, to

lessen wear, to facilitate inspection, to give an impervious surface of mechanical smoothness; at times to resist corrosion, and occasionally to prepare the surface for some applied finish.

APPLIED FINISHES is an attempt to list the usual substances, mostly of a non-metallic nature, which are brushed, sprayed, dip-coated, or baked on metal surfaces, to provide color, smooth surfaces, luster, or otherwise add to the sales appeal, or to give resistance to rust, corrosion or wear, or to simulate the appearance of another material.

COLOR IN METALS. This section of the chart is merely a sort of general summary of much that is contained in previous sections, re-classified so as to apply directly to various types

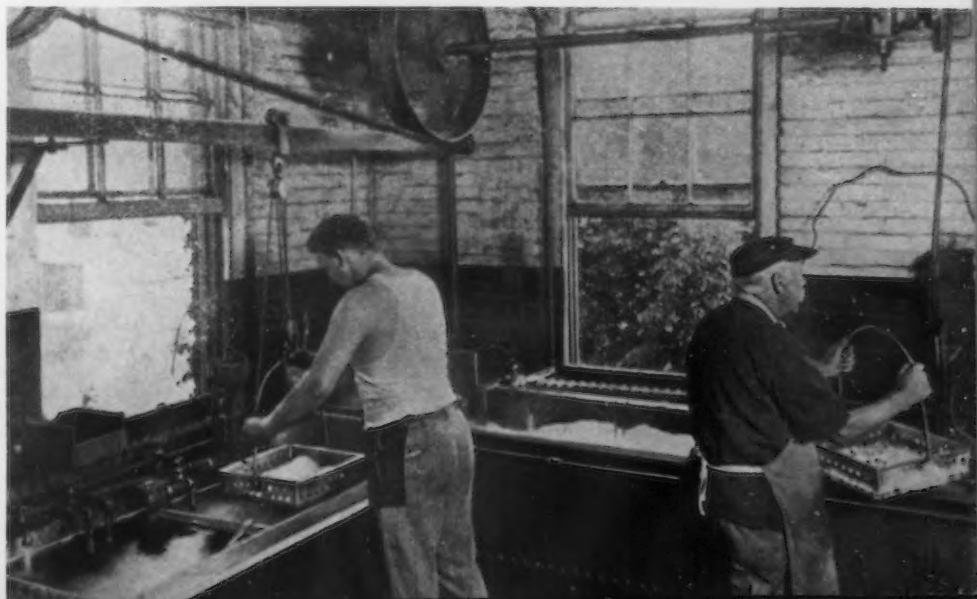
of metals. It is included only as a matter of cross-reference, and is not intended to be regarded as an added step in the methods listed.

From time to time other methods of cleaning and finishing will undoubtedly be discussed and described in this new series of articles. In every case it will be found that these methods may be classified in one of the first eight sections of the chart. That they are not listed at present simply indicates that their use is not as yet widespread enough to warrant their inclusion in a classification of "principal methods."

Economic Values

Paradoxically, the added cost of cleaning and finishing metals is a factor which must not increase the

FIG. 4—Cleaning in a silverware factory. An eccentric-driven agitator moves a false bottom on which the baskets are set. (Courtesy Magnus Chemical Co.)



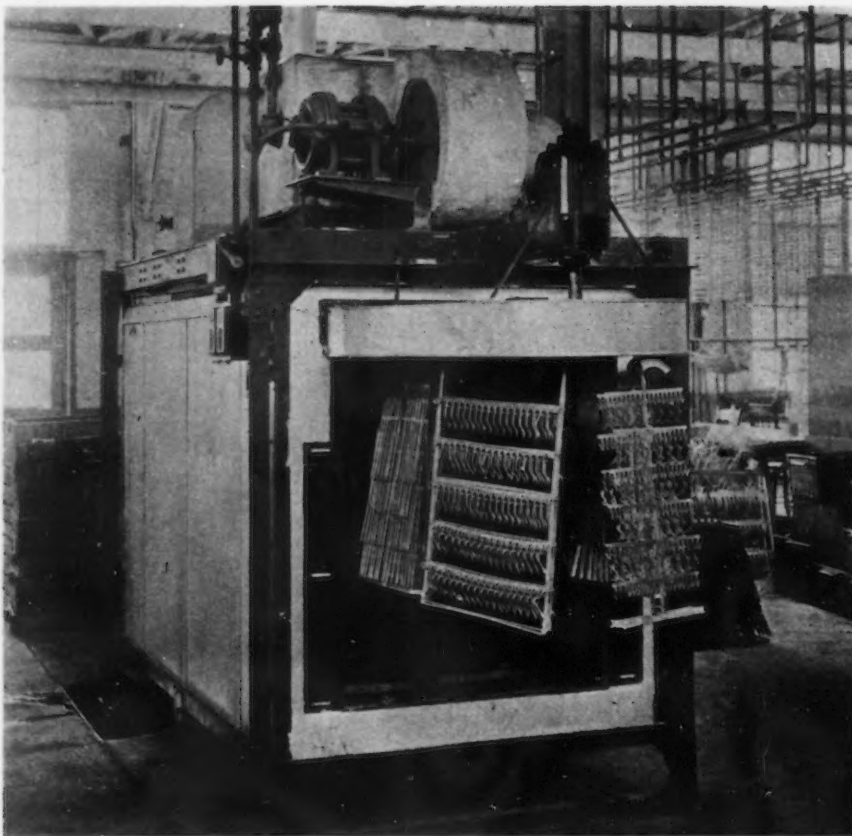


FIG. 5—Conveyor-type dryer in a plating department for drying parts coming directly from hot rinse tanks. A hot air circulating system leaves the metal clean and dry. (Courtesy Gehnrich Oven Co.)

final cost of the product to the consumer. Since any added cost whatsoever generally increases the production cost (except where the operation involved results in a simplification of some other process, or makes some other process less costly), the point where a saving in final costs may be made is usually in the cost of sales. This is the basis for the statement that the subject of metal cleaning and finishing as a whole has graduated from the "necessary evil" phase, and is now being looked at from the standpoint of a way of definitely increasing the sales appeal of the product.

A specific example was worked out by H. R. Simonds in "How Attractive Finish Helps Metal Product Sales" (*THE IRON AGE*, Jan. 17, 1935) for the case of a pencil sharpener. There it was shown how the added cost of a new finish, multiplied by the sales of the product, must not exceed the profit on the unfinished article, to possess a definite economic value. But there are two ways of striking the necessary economic balance, once the cost of the finishing operations is known.

The first is to figure how much

easier it is to sell the finished article than the unfinished. This strikes directly at the cost of selling. For, if the time and effort which would normally be expended on selling can be materially reduced by virtue of the increased sales appeal the finish imparts to the article, manifestly one of the large items in the final cost to the consumer will be sharply cut, even though the total volume of sales remains the same.

Or, the sales appeal imparted to the article by the finish may be so great that the actual volume of sales becomes much greater than was the case with the unfinished article, the

total cost of selling remaining the same. In this case, the unit cost of selling goes down; and whenever that unit cost of selling is reduced as much as, or more than the added cost of finishing, that finish is economically justifiable.

All of this is elementary, of course, but since it is the basis of the economics of the metal cleaning and finishing problem, it is quite necessary that it be stated clearly and succinctly. It is through this approach to the question that light has been thrown vividly on the comparative costs of cleaning and finishing operations, in relation to their actual advantages from the point of view of added sales appeal. Every case in each manufacturing plant must be weighed separately to determine whether the cost of the finish is actually balanced by a real sales advantage; for if it is not, the chances are that the article in question should not be finished, or should be finished by some other, less costly method.

Since no general rules can be formulated to apply to every case, the articles to follow in this series will be so written as to enable the reader to apply the economic factors involved to his own problems himself, to the end that he may make his own determinations of the values to be expected.

Closely allied to the question of sales costs in this matter is the matter of customer good-will springing from the permanence of the character of the finish. This introduces the question a manufacturer may well ask, "How much can I afford to pay for a finish which will last blank years?" And from this still another question leads, "Without changing the appearance or permanence of the finish I now use, is there another, less costly way of accomplishing the same result?" The answer to all of these questions is tied up with the matter of keeping accurate cost-records, and

(CONCLUDED ON PAGE 48)

FIG. 6—Die casting before and after ball burnishing. (Courtesy Magnus Chemical Co.)



Making Lighting Panelboards For the World's Fair

SHEET metal operations illustrated in these pages were taken from the practice of the Gillespie Equipment Corp., Long Island City, N. Y., a firm that specialized in lighting and lighting control equipment for the Century of Progress in Chicago and that recently moved to its present permanent location to take care of similar work for the New York World's Fair of 1939. All the equipment installed in the present plant is new, however, and some of the press tooling represents new approaches to the problem of manufacturing electrical control boxes of a wide range of sizes. The company is the only control box maker in the East that is also engaged in the production of lighting trough, strip and border lighting equipment, using much the same equipment as for the boxes. As such, the layout is representative of good practice in handling variety work in a small sheet metal shop.

The shop layout is such that blanks for the panelboard boxes and their covers are cut to size and resquared in the front of a Niagara BL-10

shear, not shown, which is equipped with extension squaring gage having a graduated scale and adjustable stops for quick setting. These blanks then go down a line of three presses, thence to a Dreis & Krump press brake and finally to a spot welder. Strips for use in making the troughs are cut

to width on the same shear against the back gage so they come out the back, then go down another aisle to the No. 44 deep throat press, Fig. 6, where the socket holes are pierced, then to the brake and assembly floor, making two distinct production lines. Hand brakes are also used for decora-



FIG. 1—This corner notching die for electrical panelboards is so designed that the box can be prepared for riveted type corners, for welding by the projection method or by ordinary spot welding. It is adjustable for boxes from 2½ to 9 in. deep. It is also possible to punch the panel mounting hole in the same operation. Depth adjustment is made by shifting stop bars held in slots in the bolster by hollow head set screws.



FIG. 2—In view of the fact that the open end of the box must have a $\frac{3}{4}$ -in. flange turned toward the inside, it is necessary to miter the outer corners of the notch previously cut. In this set-up the lower bolster has a 45-deg. angle fixture bolted to it for a guide, and the upper die carries a straight shear blade with a step in one end to allow for the offset of one sheet thickness on one side in the bend. No change in gages is required in changing from one box depth to another.

c o o



FIG. 3—Since there is no end to the combination of size, number and location of knockout holes for conduit connections, the problem at Gillespie is solved with individual die sets for each size hole. The work is laid out with center punch marks, which are lined up by eye with the spring-backed pin extending from the punch. All but a $\frac{1}{16}$ in. lug is pierced and the sheared piece is set back in the sheet by a plug in the lower half of the die set. This plug is spring loaded by springs mounted under the bolster plate. The dies are easily and quickly changed, being located by a V-shaped tail engaging a dovetail holder set screwed to the bolster plate. Location lengthwise is by a dowel pin with bent arm for easy removal. Six sets take in a range of hole sizes from $\frac{1}{2}$ to $2\frac{1}{2}$ in.

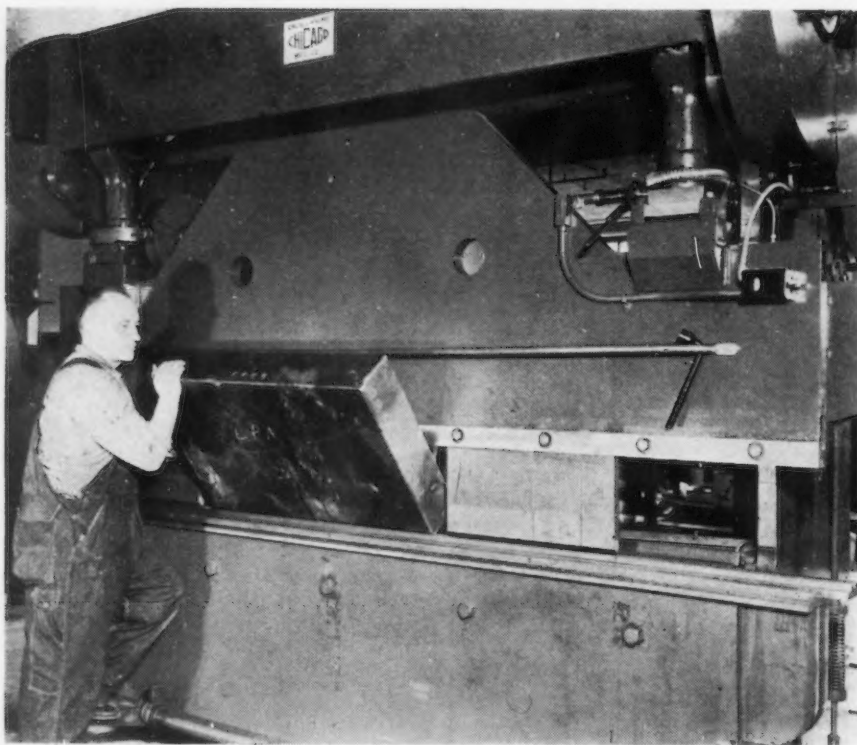


FIG. 4—Boxes are finally formed by braking them in a V-bending die. This view shows the use of sectional male dies in the final closing operation.

tive and theatre lighting unit manufacture, and there are long benches for layout work and electrical assembly. At the far end of the shop is a spray booth for finishing trough and cove lighting units.

Attention is called to a number of departures from standard practice for large size switch box work. The corner notching die, Fig. 1, is made as universal as possible. It will accommodate box depths ranging from $2\frac{1}{2}$ to 9 in., for example. The same press, a Niagara size A 4, also is used for the door corner notching die, Fig. 4. The die for mitering the four corners, Fig. 2, is also a universal tool for all depth of boxes. By using a straight shear blade with a step in one end, the necessary allowance is made for the offset equal to one stock thickness when the box is formed up with an inside flange at the front. Ordinarily this mitering is done in two steps to take care of the offset. The specially designed die sets for punching out and resetting knockout holes, illustrated in Fig. 3, also represent an innovation.

These boxes have doors flush with the mats or covers, with a wide variety of sizes called for corresponding to the numberless box sizes made on order. To conserve material, it is necessary to use the piece cut out for the door opening as the door itself. How this is done with a large size corner cutting die is shown in Fig. 4. This new method produces a cleaner job and the piece comes out flat. Heretofore, also, box manufacturers have been spot welding hinges to the doors and covers, requiring two press operations to prepare these hinges. Gillespie has instituted the idea of using a continuous hinge, eliminating the press operations. Allowance for the continuous hinge is made when trimming the cut-out blank to fit as a door.

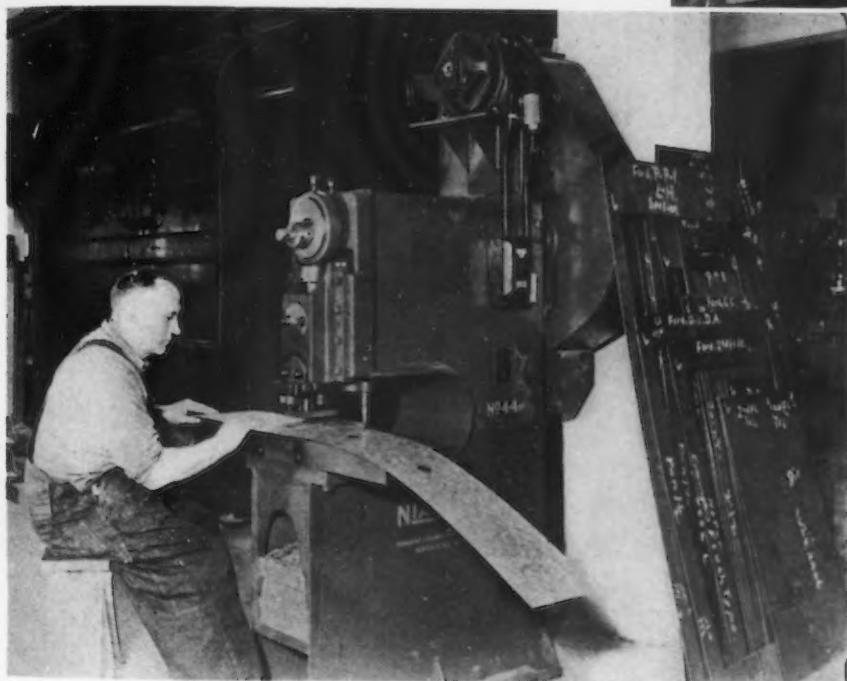
BELOW

FIG. 6—Socket openings in strips used to form trough lighting units are blanked out in this Niagara No. 44 press, using the die set shown and locating from a gage. The sheet metal sections lying against the pillar are doors and "trims" for panelboards, illustrating the wide variety of sizes made.



ABOVE

FIG. 5—Doors and cover plates are blanked out of the same piece of stock. At Gillespie, instead of using a small corner notching die, 3 in. on a side and taking separate bites along the side with a 6- or 8-in. knife in another die, a large corner notching is employed, with one knife about 23 in. long and the other about 12 in. long. Both knives taper from the corner out so that by changing the adjustment of the press slide, it is easy to regulate the length of the cuts. With such a die it is possible to cut out a complete door in four strokes of the press for at least 90 per cent of the door openings.



Inland Steel Acquires Drum Manufacturer

CHICAGO—Officers of Inland Steel Co. and of the Wilson & Bennett Mfg. Co., Chicago, last week agreed to a merger of the two corporations, subject to ratification by the respective stockholders, and approval by the SEC.

Wilson & Bennett, with plants in

Chicago, New Orleans and Jersey City, N. J., is one of the largest makers of steel drums, pails and barrels in the United States, and has been one of Inland's important customers. Although nothing official has been said, it is believed that the new subsidiary, after approval, will be operated as a separate corporate identity as is Joseph T. Ryerson & Son, Inc.

Rail Taxes \$9.70 of Each \$100 Received

FOR every \$100 received for the transportation of passengers, freight, express and mails and all other services, the railroads paid in taxes \$9.70 in 1938, compared with \$7.82 in 1937, and \$6.13 in 1927, according to the Association of American Railroads.

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THE butcher and the baker, the business man and the technical man alike find a visit to Battelle Memorial Institute, Columbus, Ohio, an interesting and stimulating experience, because Battelle is engaged in one of the most fascinating of human activities, the search for knowledge—knowledge, in this case, whose bearing on industrial progress has a meaning for each of them. Endowed as a non-profit institution for industrial research, it employs a technical staff of nearly a hundred men. It began work almost ten years ago, and in that period has developed a clear conception of its purpose and an efficient method of operation.

Research for industry is the purpose for which the Institute was founded. At the start attention was centered on metallurgy and fuels, but the field of interest has grown until now work goes on in metallurgy and fuels, ceramics, organic and inorganic industrial chemistry, and in ore dressing, coal preparation, and materials concentration. Research in all of these fields is sponsored by individuals, industrial companies, groups of companies cooperating on problems of mutual interest, or industrial or trade associations.

The information gained through sponsored research and any patents resulting from it are wholly at the disposal of the organization financing the work. Publication of results may or may not be contemplated.

Research for industrial sponsors, done at cost, makes up the bulk of the work, but the use made of income from the endowment is an equally essential factor in the Battelle scheme. This income supports, wholly or cooperatively, a large body of research given, in effect, as a public service.



Industrial Research

It pays the cost of long-term fundamental research on problems of possible industrial significance; projects adapted to the Institute's scheme of research and education; investigation of current technical questions, often controversial, which can be handled creditably only by a disinterested, impartial research agency; authorship and editorial contributions to the literature which, in the aggregate, account for an impressive amount of time and conscientious effort.

Battelle's organization comprises a self-perpetuating board of trustees, a director and administrative assistants, business office and service departments, and the following twelve research divisions: physical metallurgy; ferrous foundry and process metallurgy; steel manufacture; non-ferrous metallurgy; physics; electro-metallurgy and hydro-metallurgy; fuels and combustion; fuels chemistry; coal preparation and ore dressing; ceramics and refractories; inorganic chemistry; and or-



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READILY accessible library information is essential to industrial research. Battelle's library is not only very beautiful but is also one of the best stocked and catalogued in the country.

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gets the advantage of his added experience.

Still another use of Battelle funds is essentially educational, in that it is a means of sharing with industry the experience of the Institute's personnel and its accumulated scientific and practical knowledge. This was the reason for undertaking such work as that done on the "Alloys of Iron" monographs, several of which were written at Battelle, and on the revision of Bullen's "Steel and Its Heat Treatment," just now off the press. Likewise, the activities of staff members in professional societies, participation in association research programs, preparation of articles for trade journals and technical press, all serve the Institute's educational purpose.

Battelle has excellent plant and equipment. In the main building, which has 90,000 sq. ft. of floor space, three upper floors of the main section and part of the fourth floor wing contain the analytical laboratory, micrographic and photographic rooms, physics laboratory, and some 30 individual or joint offices and laboratories. The basement contains the X-ray and electron diffraction laboratory, the machine shop and carpenter shop, and supply rooms.

One large three-story laboratory occupies most of the wing of the main building. A forging hammer, two furnaces, rolls, and wire-drawing machine are set up here, and a number of pilot-plant or other large installations, particularly for combustion and fuel research, that need space and head room. On a wide second-floor balcony are the mechanical testing laboratory and the heat-treating laboratory. Off one end, work on high-pressure chemical synthesis has a room to itself.

In another building, of 33,000 sq. ft.

o o o

h at Battelle

By D. R. JAMES

Cleveland Editor, The Iron Age

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ganic chemistry. Each of these divisions is headed by a supervisor who has technical direction of the men in the group.

A research project may fall wholly in the field of one such division, or may have phases that require the participation of others. In any event, the cooperation and advisory service of every department is always available.

A portion of the endowment income is used to train men in research.

Several men are receiving training as research associates, their salaries and expenses paid from Battelle funds. Research associates are likewise supported by industry, or jointly by Battelle and outside contributors. The associate may be chosen by the latter, perhaps from the staff of an industrial research organization, and put to work on some problem of particular concern to that company. Then, at the end of the agreed period, the associate returns to his former employer, who



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THIS oil quenching bath in the heat treating laboratory is designed to provide uniform quenching conditions for all of a series of samples.

° ° °



° ° °

THE characteristics of rolled metals receive considerable attention. This two-high stand of rolls is equipped to take billets up to 1 1/4 in. in size.

° ° °

floor space, built in 1937, a research laboratory for the study of foundry problems takes the two lower stories. The concentration laboratory occupies the third floor, and on the fourth are a number of offices and single laboratories.

The experimental foundry is unique both in the completeness of its equipment and the convenience and efficiency of its arrangement. There is an 18-in. cupola, a 400-lb. indirect arc furnace and a 500-lb. direct arc unit, a 500-lb. high-frequency induction furnace, a low-frequency induction furnace of equal capacity, a fuel-fired crucible furnace, and two 35-kva. oscillator-type induction furnaces that are adaptable to vacuum or controlled atmosphere melting. Platform scale, sand preparation and molding equipment, core oven, and sand-blast are conveniently placed, and the entire foundry floor is served by a 5-ton, cab-controlled crane.

The third floor laboratory, where work on cleaning and concentrating processes is carried on, is equipped with jigs, tables, flotation machines, launderers, classifiers, and float and sink apparatus. Many of them are of

THE air-driven
forging hammer is
a much used piece
of equipment.



new and special types, designed by the staff. A separate building with about 5000 sq. ft. of floor space, contains crushing and grinding machinery and storage bins for coal and ore.

Brief description of a few metallurgical projects will illustrate the types of research carried on in this field at Battelle.

An important early project was a study of the embrittlement of hot galvanized structural steel. This investigation, sponsored by the American Society for Testing Materials, not only disclosed the previously unknown causes of injurious embrittlement, but made it possible to formulate a guide for guarding against it. A new free-machining open hearth steel recently introduced to the market is the result of cooperative research by Battelle and the research division of the Inland Steel Co.

Numerous developments in the ceramics field have been of particular interest to metallurgists, including a process for making insulating brick and insulating fire brick, a dolomite cement for refractory purposes, and a process for improving the quality of magnesite refractories, using domes-

THE motor-generator, high frequency melting equipment includes three furnaces, one larger and one smaller than the 125-lb. unit shown in use here.



tic magnesites not previously employed.

Work begun at Battelle for the Copper and Brass Research Association, and later continued for the Kennecott, Anaconda, and Phelps Dodge companies, led to new knowledge and verified some contested claims concerning the properties and best plant practice for copper-bearing and copper-alloy steels. Similarly, as a result of a project sponsored by the Monsanto Chemical Co., it was definitely proved that phosphorus in steel, far from being invariably a nuisance, as once believed, imparts exceedingly useful properties to certain steels. This work on copper and phosphorus was only partly of a pioneering nature, being designed chiefly to give conclusive evidence on previously debatable questions.

Another noteworthy clarification of a previously debatable question was in work sponsored by the Joint Research Committee on "Effect of Temperature on the Properties of Metals," in which it was shown how markedly the creep resistance of steel at high temperature is altered by changing the austenitic grain size. This accounts for many of the annoying discrepancies in behavior that have appeared in service and in published tests.

Research has been conducted upon

the combustion of industrial coals, and the development of vitreous enamels for copper. Considerable experimental work has been carried on at Battelle by the International Tin Research and Development Council, on bearing alloys, on metal spraying, on vapor-phase coating, on soldering, and on the diffusion of tin into copper and iron. Comprehensive reports have been issued on tin plate and can manufacture.

A paper at the last American Foundrymen's Association meeting, reporting an outstanding piece of metallurgical research, was based on a project sponsored at Battelle by the Aluminum Co. of America. This concerned the use of aluminum as a deoxidizer in cast steel, and the conclusion was reached that aluminum additions, long known to be effective in securing sound castings, need not, as formerly supposed, affect the mechanical properties of the steel adversely. It was found that while additions of a certain number of ounces per ton of steel, representing the range previously used, tended toward lowered ductility, a slight change in the amount added achieved the desired effect with practically no dropping off in physical properties.

Corrosion problems have long been

represented among the Institute's projects, and at present the Alloy Castings Research Institute is supporting a study of the behavior of a large number of alloys in various corrosive media, as well as a comprehensive study of their properties and behavior at high temperatures.

Gordon Battelle, Columbus industrialist, bequeathed the funds to found the research institution, which should be at the same time a memorial to his family and a continuing servant of society. The endowment was later increased by the will of his mother, Annie Norton Battelle.

The Institute represents different things to different people. To the metallurgist it may appear a metallurgical research institution, or to the ceramist a ceramics laboratory. Professional societies know its staff members as active committee workers and frequent contributors of papers. An increasing number of young research workers see it almost as a training school, with "alumni" already out in industry. Scores of industrial concerns regard it as their own, or a branch of their own, research laboratory, to which they look for new or better products and more economical processes.

Standard Steel Spring Co. Opens Electroplating Plant

STANDARD STEEL SPRING Co., Coraopolis, Pa., opened on Monday a new electroplating plant especially designed to handle large sections of steel for finishing with nickel plating of a pore-free type. The announcement was made by W. F. Rockwell, chairman.

First shipments from the new plant will go to the Texas oil fields, where the inroads of corrosion are increasing production costs, he said. Thorough trials of this pore-free coating which ranges up to 20 times the normal thickness of nickel plating, have demonstrated its resistance to corrosion in the wells, the company announced. Besides the oil fields the new material is designed for uses in which ordinary steel corrodes badly, thus extending the market for steel in the

manufacture of barrels, tanks and other containers for shipping and storing corrosive chemicals.

"The new electroplating process which makes this material possible requires accurate technical control," Mr. Rockwell said, "but as the process is largely automatic, the results can be duplicated regularly in commercial production. The need for such a process as ours was brought to our attention by engineers long familiar with the inroads of corrosion. The nickel deposit which constitutes the heavy plate is malleable and withstands abrasive as well as corrosive attack. Thus this new product adds to the list of economical structural materials with corrosion resistant surfaces."

A fellowship has been established at

the Mellon Institute of Industrial Research to study the process and assure its scientific application to new fields of use.

Australia to Have Abrasive Plant

AUSTRALIAN interests have sought the cooperation of American and British grinding wheel manufacturers in forming an Australian company to produce grinding wheels and allied abrasive and refractory products.

The new plant of Australian Abrasives Pty. Ltd., will be located on a four-acre tract in the industrial district of Sydney, New South Wales. Construction will begin in about one month. Interested in the new company are the following: Carborundum Co., Niagara Falls, N. Y.; Norton Co., Worcester, Mass.; Universal Grinding Wheel Co., Ltd., Stafford, Eng., and William McPherson of McPherson's Pty. Ltd., Australia

G-E Domestic Boilers Are Electrically Welded

GENERAL ELECTRIC domestic heating units, whether they be steam, hot water or hot air, employ an all-welded construction for the steel boilers or heat transfer units. These welding and prior forming operations are now performed at the Bloomfield, N. J., plant, and practically all the equipment is new and was bought specifically for this work. These operations consist of bending, forming, and flash, spot, seam or arc welding. The material is steel, 3/16 to 1/4 in. in thickness, and it is supplied in flat blanks that are already trimmed and perforated. This eliminates the blanking operation at the plant.

The first step in the manufacture of G-E heater drums is to roll the blanks to a cylindrical form. There are three popular sizes of drums, ranging from 27 in. long by 19 3/16 in. diameter to 42 in. long by 27 11/16 in. diameter. There is also a larger unit 45 1/2 in. long and with an oval cross-section, the major diameter of which is 30 7/8 in. To handle this range of work, there has been installed a pinch-type bending roll, having 9 in. diameter rolls and 62 in. between housings. All three rolls are power driven from a single 10-hp. motor through an enclosed worm gear drive. An additional 7 1/2-hp. motor is used to adjust the top roll for regulating the degree of bend. Drop of the end housing for removing formed drums is facilitated by an air cylinder, and in addition there is a second air cylinder used to counterbalance the top roll when the housing is dropped. Plate speed is 25 ft. per min.

Any inaccuracies in making the ends meet is corrected by a few dexterous drops of the shell on the floor prior to flash welding into a solid unit. The flash-welder seen in Fig. 1 is the machine used for this job. It will take shells up to 60 in. long, is rated at 1000 kva. and is said to be the largest of its kind, a type developed primarily for range boiler and barrel manufacture.

The presence of scale on hot rolled material was found at first to cause trouble with the electrodes. Therefore the surfaces adjacent to the weld are ground clean with a portable electric

grinder. Welding dies are water cooled and are made of Mallory Elkonite, but with the high pressures developed by the air clamps, even this hard material would be brinelled by scale, if present.

Seams Flash Welded

In operation, the shell is slipped over the split upper clamp arms, after which the heat-treated aluminum latches are swung into place by hand. Clamping pressure is applied through these latches, and hence the clamps, by means of four air cylinders, two of which can be seen in the photograph.

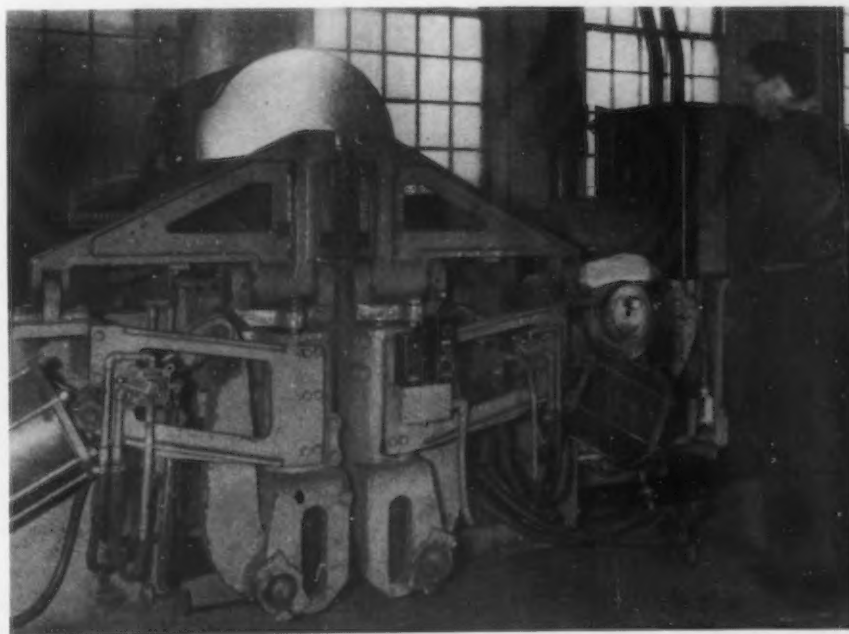
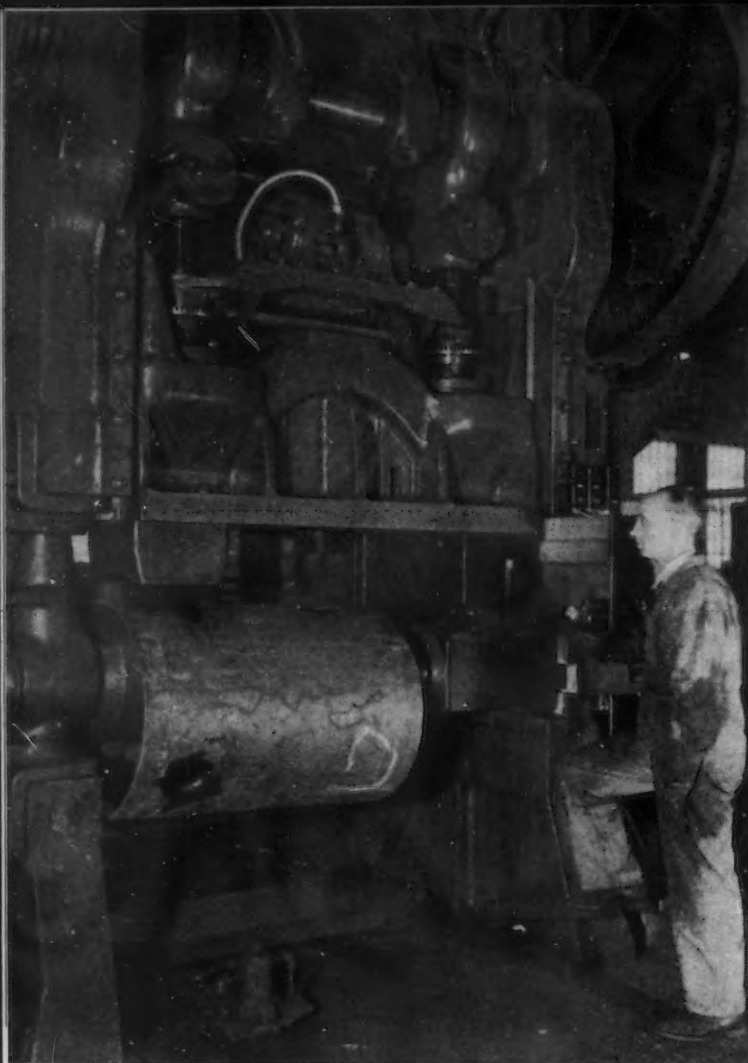


FIG. 1—Roll formed boiler shells are flash welded at the seam in this 1000-kva. machine, said to be the largest flash welder built for this type of service.



AT LEFT

FIG. 2—In this special gap press with pivoted stake, previously perforated holes have bell mouthed flanges formed around them.

o o o

BELOW

FIG. 3—Flanged heads being spot welded to the drum of a hot air furnace shell, prior to seam welding.

Welding cycle is entirely automatic, being started through a treadle switch. Cycle time is controlled by the speed of the master cam, which is driven through the medium of a variable-speed drive. At the completion of the arcing, which may vary from 9 to 15 sec., according to the thickness of the material, the movable platen is advanced toward the stationary one and the hot metal squeezed together. The flash formed at the joint is later removed by a flash stripper.

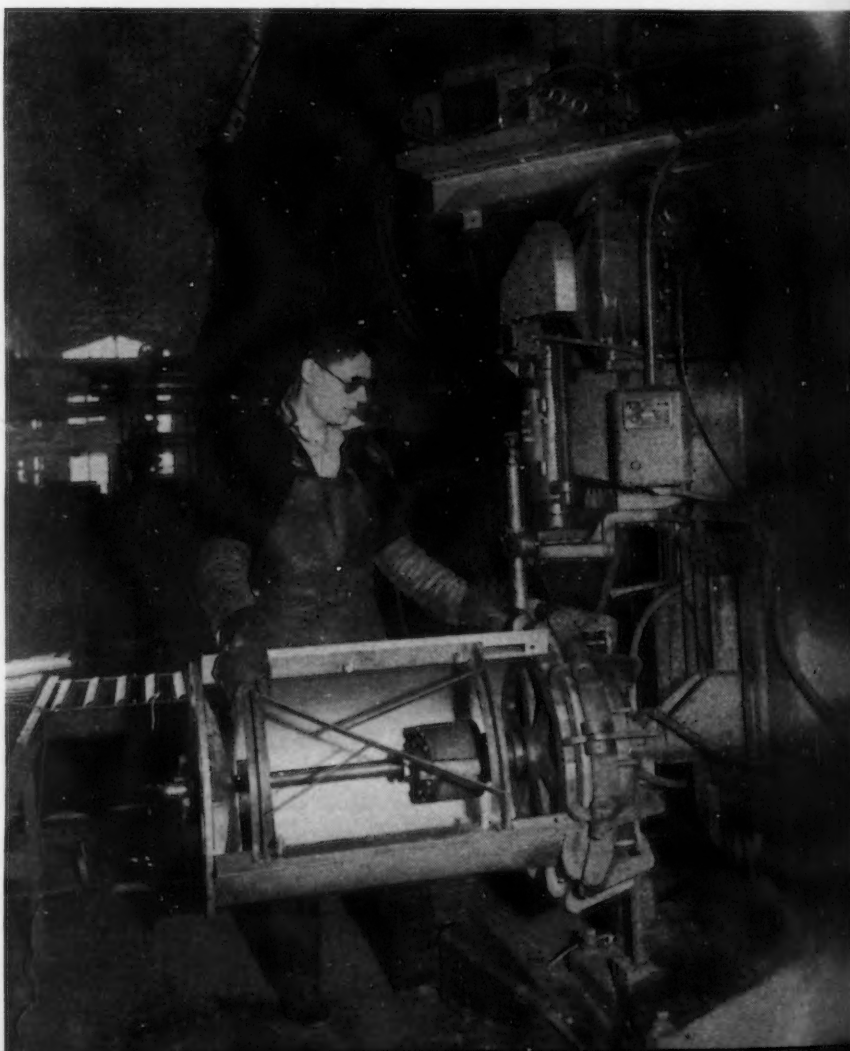
The familiar round G-E welded steel oil-burner boiler is fundamentally a shell within a shell, that is, the water space is formed between an outer and an inner shell. Certain through connections are necessary, for smoke pipe connection and the like, and to make them, bell shaped extrusions are formed in the outer shell, extending toward the inner. As mentioned, the blanks are already perforated, and the extrusion is done on an unconventional horning press with pivoted stake. The machine, Fig. 2, is primarily a modification of a straight-sided double-crank gap press. Since the boiler drum is already welded into a complete cylinder, it was necessary to design the stake so that one end could be

swung free of the housing in order that the drum could be slipped over it.

When interchanging stakes, it is merely necessary to swing the stake clear of the housing, back off the large capstan nut and slip the threaded end out of the hole.

As can be seen, the stake is rotatable about a vertical axis to allow it to be swung free of the right-hand housing. To accomplish this motion, a hydraulic actuator is provided on the left-hand housing, connected by link to a radius arm on the stake pivot. At the other end, the stake fits the housing with a tongue and groove arrangement and is securely held in position by an automatic spring lock. This lock is released by a hand lever, next to the valve for operating the hydraulic actuator. A treadle operated block clutch is used for operating the regular press slide and it is arranged with a safety lock to prevent an accidental repeat stroke.

The stake shown is equipped with a punch and die to form the bell-mouth hole, but this die set can be removed and a different combination substituted. In some instances, a shearing or other attachment is used in combination with the punching attachment so that two operations can be performed simultaneously.



Heads are joined to drums by either seam welding of flange heads, as in the example of hot air furnaces, or by arc welding flat disk heads for steam boilers. One of the essentials of seam welding is clean joints, and for the descaling operation a large shot blast unit has been installed. In this machine the work is subjected to a spray of fine metallic "shot" while it tumbles about slowly in a rotating barrel. The same cleaner serves other departments and other parts, but for convenience is situated adjacent to the seam welders.

Prior to seam welding, the heads and drums of the hot air heaters are tacked in position by means of a 150-kva. welding press, with a cam driven head and pneumatic cushion. As can be seen in Fig. 3, a special fixture has been attached to the lower stake. The multi-finger clamps holding the flange ring are pneumatically actuated. Indexing is by hand and spacing of the spots is by eye.

Use Large Seam Welder

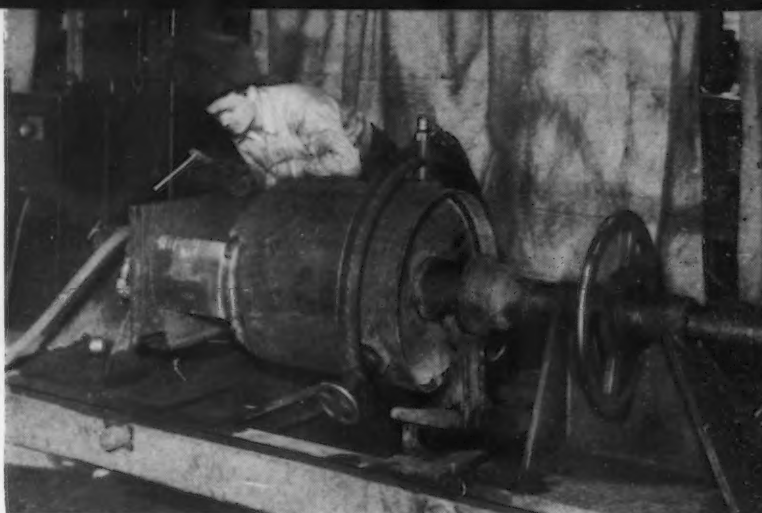
The seam welder, Fig. 4, also has a drum type fixture. It is of 400-kva. capacity, said to be the largest ever built, since it is capable of seam welding two pieces of 3/16-in. steel plate, a total thickness of 3/8 in. The transformer is of amply capacity to handle

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AT RIGHT

FIG. 6—Hydrostatic pressure test for pin-hole leaks prior to welded assembly of a boiler shell within a shell.

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o o o

BELOW

FIG. 4—A total of 3/8 in. thickness of metal can be seam welded in this 400-kva. circular seam welder, shown in operation on a G-E hot air furnace shell.



FIG. 5—A.c. welding transformers, coated rods and a power driven fixture table form the set-up for metallic arc welding of flat disk boiler heads to drums.

the maximum requirements and is provided with a large range of heat settings for each particular job. Welding speed is variable and can be infinitely regulated to the required inches per min., depending upon the thickness of the material. Welding pressure is obtained by the use of regulated air pressure. All portions of the machine used to make up the welding circuit are of copper or copper alloys. Other parts of the machine, including the

(CONCLUDED ON PAGE 61)

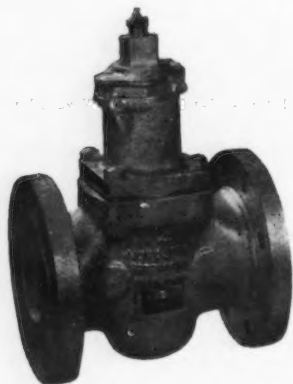
New Devices for Plant Service

THREE different styles of port arrangement are available in the new line of three-way brass lift-plug valves offered by the *Homestead Valve Mfg. Co., Inc.*, Coraopolis, Pa. Style D permits flow from either end and out the side opening, or vice versa; style E permits flow from the left-hand end and out the side opening or straight through, and style F, which permits a similar flow from the right-hand end. Direction of flow is changed by a quarter turn of the operating lever. The powerful leverage and screw of the left-plug feature are said to assure not only easy operation, but also sealing of the plug in the body in any one of either of its two extreme positions of travel or in a mid-position with all ports closed. These valves are made in sizes from 1¼ to 3½ in.

Sub-Zero Valve

FORMULATION of a cast steel that will meet the impact requirements at low temperatures was largely responsible for the successful development of a lubricated plug valve by the *Merco Nordstrom Valve Co.* These valves will operate at temperatures as low as -150 deg. F. The steel from which the bodies are cast corresponds to the analysis of the following typical heat:

Element	Per Cent
Carbon	0.08
Manganese	0.29
Silicon	0.12
Phosphorus	0.015
Sulphur	0.018
Nickel	4.06
Vanadium	0.16
Molybdenum	0.50



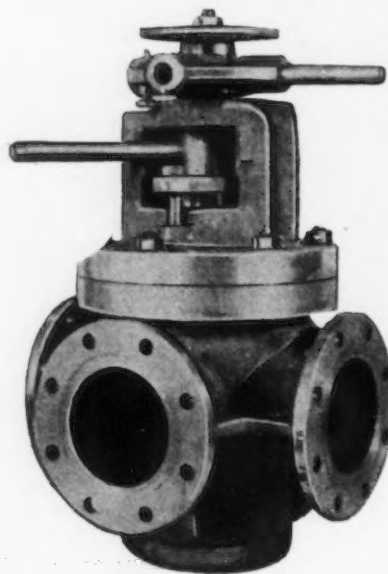
40—THE IRON AGE, January 26, 1939

After casting, the valve bodies are subjected to a heat treatment that consists of normalizing at 1800-1850 deg. F., oil quenching from 1500-1550 deg., and drawing at approximately 1200 deg. The castings are held at normalizing, quenching and drawing temperatures for 1 hr. per in. of section.

The physical properties developed by the above treatment are:

Tensile strength, p.s.i.	107,000
Yield point, p.s.i.	88,000
Elongation in 2 in., per cent	22.5
Reduction of area, per cent	61.0
Charpy impact ft.-lb. (-150 deg. F.)	20.0

Chrome-molybdenum steel (SAE 4140) is used for all parts made from forged or wrought steel, such as studs. This particular steel was chosen because of its good impact strength at sub-zero temperatures. These forged parts are also heat treated. The design of the shank housing embodies an elongated casting, permitting a



A NEW line of three-way brass Homestead lift-plug valves has been developed for use on air, water, oil and gas service at working pressures up to 150 lb. and temperatures up to 400 deg. F.

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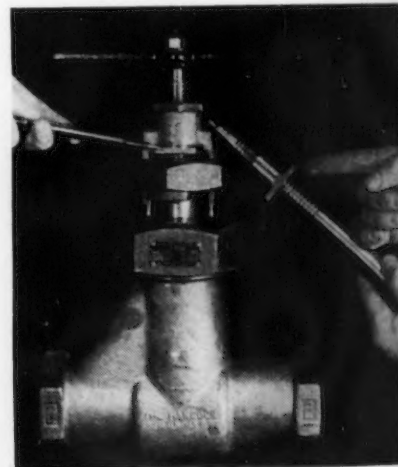
AT LEFT

THIS sub-zero Nordstrom lubricating plug valve is designed to operate at temperatures as low as -150 deg. F.

complete insulation around the plug shank. These sub-zero valves are produced in sizes from ¾ to 10 in.

Pressure Reducing Valves

A COMPLETE new line of Copes valves for steam and water pressure reducing service is announced by *Northern Equipment Co.*, Erie, Pa. They come in direct-operated, spring-loaded types; direct-operated, weight-loaded units; and relay-operated, spring-loaded units to cover a wide range of pressure drops and pressure regulation. Sizes range from ¾ to 14 in. pipe size. Where remote control of the pressure reducing station is required, three Copes master controls have been designed to cover a con-



THE renewable stem thread bushing of Hancock valves is now made of Duronze, an aluminum, copper-silicon alloy. The makers claim that these new bushings will operate satisfactorily without lubrication at elevated temperatures, since the bushing material has a high resistance to wear and corrosion, plus a tensile strength of 90,000 lb. per sq. in. Made by the Hancock Valve Division, Manning, Maxwell & Moore, Inc., Bridgeport.

trolled pressure limit of 2 to 600 lb. gage. Relay-operated spring-loaded valves are used with these latter controls.

Natural Gas Conversion Unit for Diesels

CONVERSION of all six-cylinder, 125-hp. Caterpillar diesel engines for natural gas operation is possible

e and Worker Safety

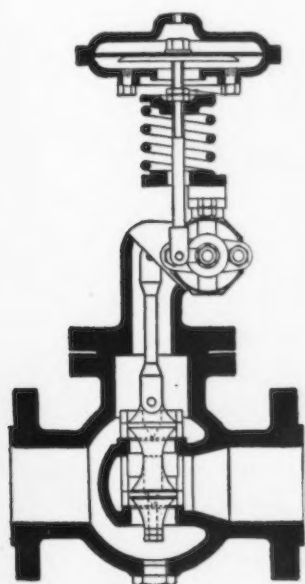
By FRANK J. OLIVER

Associate Editor, *The Iron Age*

with a new head provided by the *Caterpillar Tractor Co.*, Peoria, Ill. The regular diesel cylinder head and injection valves are removed and are replaced by a special head with spark plugs, lowering the compression ratio.

pressures ranging from vacuum to 5000 lb. and higher.

Four, six and eight diesel power cylinders are furnished for these respective air capacities. Economy is 5600 cu. ft. of air compressed to 100



AT LEFT

THE Copes type R-DBI is a relay-operated, spring-loaded, pressure reducing valve furnished in 1 to 10 in. sizes in the 125 to 900 lb. pressure standards, for use where the pressure drop across the valve is moderate. Several other styles are also offered.

o o o

AT RIGHT

SEVERAL sizes of regulator valves with rated capacities up to 6000 lb. per sq. in. for gas and air and up to 1500 lb. and 950 deg. F. for steam service are now being manufactured by the Grove Regulator Co., 1729 Poplar Street, Oakland, Cal. Air pressure permanently sealed in the dome head is used for valve motivation, doing away with spring or counterweight loading of the diaphragm. It is claimed that this principle develops smoother outlet pressures with greater control sensitivity. Valve chatter is also said to be avoided. In the event of diaphragm rupture, the valve automatically shuts off, being a single-seated type.



The fuel injection pumps are replaced by a magneto and a carburetor is added to the intake air line. The change-over takes about 4 hr. and can be done in the field. Power characteristics are essentially the same as when the engine is operated as a diesel. In addition to this attachment, the regular D13000 diesel engine is being offered already converted for burning natural gas, if desired.

Diesel Engine-Driven Compressor

A HORIZONTAL heavy duty, double-acting compressor is combined with a heavy duty V-type, four-cycle diesel engine into a single compact and comparatively lightweight unit in the type XVO compressor, recently announced by *Ingersoll-Rand Co.*, 11 Broadway, New York. Sizes are available for free air delivery ratings of 625, 935 and 1250 c.f.m. at 100 lb. per sq. in. compression. In addition, a wide variety of air, gas and ammonia compressing cylinders is available for

lb. pressure per gal. of fuel. Compactness in design is obtained by linking the diesel connecting rods directly to the master compressor rod, and employing a common crankcase for both power and compressor units. The diesel cylinders are thoroughly water jacketed and the heads are jacketed so as to give high water velocities around the valve seats and stems. The air cylinders are similarly water jacketed. Opposed fuel injection nozzles are used for each cylinder.

Exhaust Silencer

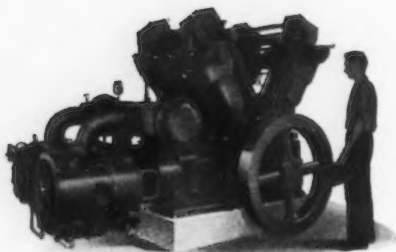
A NEW type of noise-quieting device, known as a snubber, which can be placed at any point in the intake or exhaust system of an engine or compressor, has recently been developed by the *Acoustic Division* of the *Burgess Battery Co.*, 500 West Huron Street, Chicago. It eliminates the cause of noise produced by the pulsating gases by snubbing the peak velocities and pressures.

ANNOUNCEMENTS of the manufacturers reviewed in this article cover a wide variety of miscellaneous equipment for the industrial plant, starting off with descriptions of valves for water, air, gas and steam service. Air compressors are now available with direct diesel drive. Blowers, lubricating systems, unit heaters, fire-fighting apparatus and an aluminum warehouse ladder are also illustrated. Safety apparatus described includes new types of respirators and protective equipment for eyes, hands and legs.

Two aero-dynamic effects are involved in the operation of the Burgess Snubber. First, the fast-moving slug of exhaust gas vented into the exhaust system is trapped in a high-resistance snubbing tube. This tube is perforated radially to allow the pent-up gas to vent gradually into the first snubber chamber. At the same time, a recoil pressure from the snubbing tube serves to slow up the flow of scavenged gases and thereby prevents pressure dropping below atmospheric. The slower moving scavenged gases are diverted through a low-resistance exhaust tube in the first chamber. A second stage of snubbing removes any remaining impulses which may be present in the exhausted gases. Back pressures can be eliminated or controlled to any desired value.

Cooling Water Temperature Control

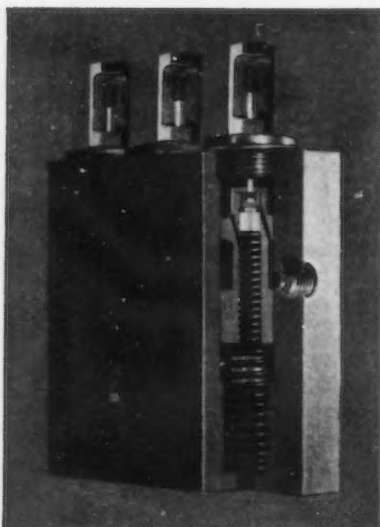
Control of the temperature of cooling water jackets of internal combustion engines and compressors is afforded by type TR-40 temperature regulator made by *Sarco Co., Inc.*, 183 Madison Avenue, New York. It can also be used in connection with the condenser jacket of a solvent degreaser. The control consists of a piston valve operated by a liquid expansion thermostat. Through means of a small adjustable bleeder port, a small amount of cooling water is allowed to flow at all times, even



THE new type XVO Ingersoll-Rand heavy duty, diesel engine driven air compressor comes in four, six and eight-cylinder sizes.

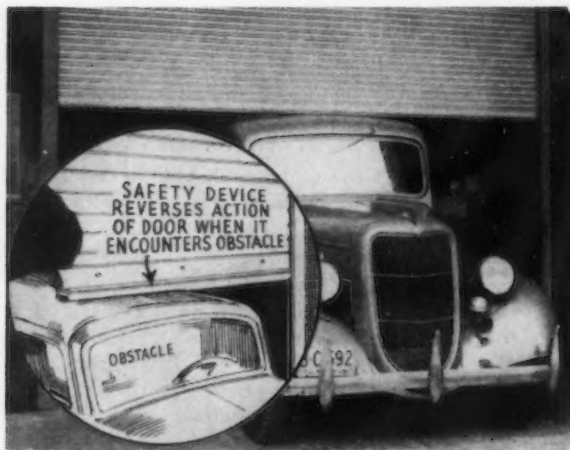


THE Burgess exhaust snubber is a new type of noise quieting device for use on the intake or exhaust of internal combustion engines or compressors.



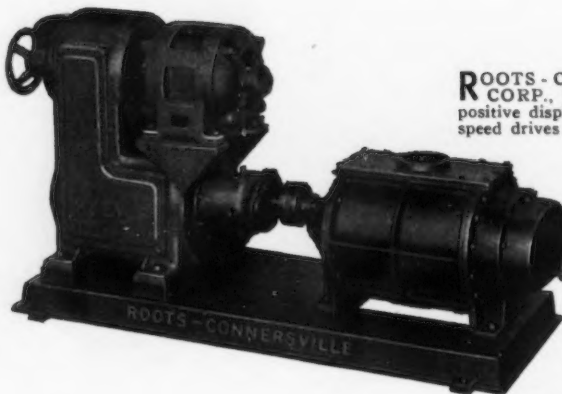
ABOVE

THE Blaw-Knox model H grease lubricating system contains a manually operated pumping unit and a new measuring valve. A three-valve block is illustrated, cut away to show the internal construction.



AT RIGHT

COMBINATION of air strainer and sight feed automatic air line lubricator made by C. A. Norgren Co., Inc., of Denver. Strainer has a 200-mesh monel metal screen supported on a 100-mesh brass screen. Besides removing dirt, the strainer traps approximately 90 per cent of the moisture. The lubricator has a transparent oil reservoir of resilient plastic, which is said not to shatter and will withstand the Underwriters' 500-lb. burst test. The oil feed is controlled by a needle valve. The new design of lubricator is available in $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{1}{2}$ -in. sizes, for horizontal lines.

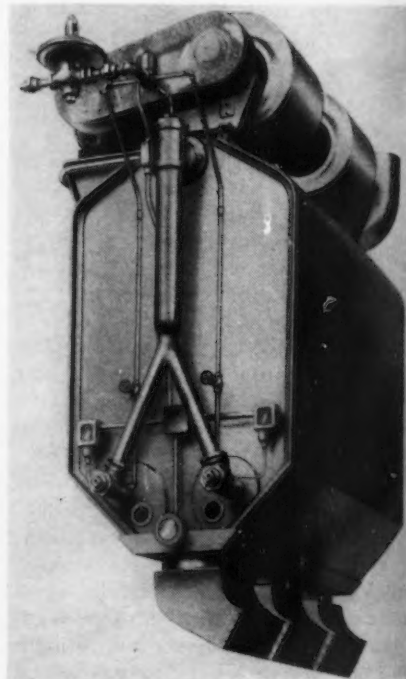


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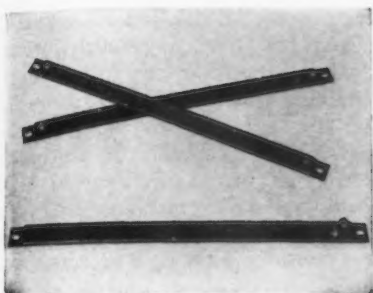
RROOTS-CONNERSVILLE BLOWER CORP., Connorsville, Ind., is supplying its positive displacement blower units with variable-speed drives of different types and ratios. Manual control is standard, but it is also possible to furnish automatically operated control to change speeds and air volumes. The size illustrated is designed to deliver from 70 to 420 cu.ft. of air per min. against a constant pressure.

BELOW

AN air-inflated rubber weatherstrip is placed along the bottom edge of this Kinnear motor-operated rolling door. In the event the door contacts an obstruction upon closing, the air is forced through an impulse switch, causing the door either to stop its travel or to revert to its full open position. This is a new product of the Kinnear Mfg. Co., Fields Avenue, Columbus, Ohio.



THE Lee gas-fired, suspended-type unit heater, made by the Dravo Corp., Pittsburgh, is a high-capacity type for use in large industrial buildings. It has an output capacity of 500,000 B.t.u. per hr., delivering 5500 cu. ft. of air per min. with an average temperature rise of 110 deg. F. Two blower type fans are used to spread the air, and outlet air velocity is 2000 f.p.m. Unit measures 3 ft. wide, 5 ft. long and 7 ft. high.



NEW types of strip heaters made in two temperature ratings of 750 and 1250 deg. F. on the sheath are announced by Westinghouse. Made in lengths from 8 to 43 in. and in capacity from 150 to 1250 watts, these heaters are particularly applicable on crane cabs, elevators, ovens, hot tables, metal molds and foundry platens. They may be obtained with both terminals at one end or at opposite ends. Heating elements are completely enclosed. Available for operation on 115, 230 and 250 volts.



TYPE C eyeshield, introduced by the Jackson Electrode Holder Co., Detroit, consists of a flexible transparent, non-inflammable visor obtainable in clear, smoked, light green, dark green or amber shades, adjustably hinged to a light headgear. Ample ventilation eliminates fogging. Designed for use of welders, for chipping operations and for general eye protection in industrial plants.



SOLID type No. 206, platform type, warehouse ladder made of 51 S.T. Alcoa aluminum weighs only 43 lb., but will support 1000 lb. The bottom of the ladder measures 28 x 22 in. and the platform, 22 x 22 in. Platform is 66 in. from floor. Of riveted construction, such ladders may be built to almost any dimensions. This is a product of the Aluminum Ladder Co., 130 Fifth Avenue, Tarentum, Pa.



DUPOR No. 46 is a large capacity respirator approved for lead dusts, made by H. S. Cover, South Bend, Ind. Twin filters of special felt have a total area of 46 sq. in. and are adjustable and removable. Face piece is of soft rubber, and a face cloth is also provided for wearer's comfort. Approved by Bureau of Mines for type A pneumoconiosis producing and lead dusts.



REVERSIBLE chrome leather hand-guard No. 12237, recently placed on the market by the Industrial Gloves Co., 734 Garfield Boulevard, Danville, Ill. may be worn on either hand. Steel ribbons have been placed diagonally on wearing surfaces to give protection against sharp, cutting edges of such objects handled as sheet metal, stampings, angle iron, etc. Guard is 7 in. long and may be worn with cotton gloves. May be had also in wool felt, cotton webbing and rubber, and in 6 and 7½ in. lengths.



ELLWOOD SAFETY APPLIANCE CO. Ellwood City, Pa., is offering a new style of fiber shin guard formed to the contour of the leg. May be worn either inside or outside of clothing. At the top and bottom of the guard on the inside there is a molded sponge rubber pad which acts as a cushion and shock absorbing device, at the same time affording greater freedom of movement.



FULL vision lenses and a lightweight canister are featured in the new No. 5 snout type canister gas mask, made by Acme Protection Equipment Co., Inc., 3645 Liberty Avenue, Pittsburgh. Canisters are available for protection against organic vapors and acid gases, ammonia, hydrocyanic acid, chlorpicrin and other poisonous gases.



M. S. A. lightweight 1-hr. oxygen breathing apparatus for respiratory protection in atmospheres containing concentrations of gases too high for safe use of the canister-type masks.

A CENTRIFUGAL type fire pump can now be supplied mounted on the front end of the Clarktor-6 industrial tractor. A floating flexible drive is provided between the 46-hp. engine and the pump. When taking supply through a 4-in. suction opening from a 30-lb. hydrant, the pump will deliver 400 gal. per min. at 120-lb. pressure with the motor running at 1800 r.p.m. A high pressure, small nozzle is generally used, creating a fine mist at the end of the stream of water. Pump is automatically primed by means of vacuum from the motor intake manifold.



when the valve is closed. An innovation is a safety fusible plug inserted between the thermostat plunger and the valve spindle in such a way that in the event of thermostat failure, the plug will collapse and the water valve will be forced wide open. The control is available in $\frac{3}{8}$ to 1-in. pipe size connection.

Grease Lubrication System

For cranes and auxiliary equipment, the model H grease lubricating system is offered by the *Gordon Lubricators Division, Blaw-Knox Co.*, Pittsburgh. The manually operated pump holds 8 lb. of grease. Double action pistons reduce the time cycle of operation, and the handle is detachable to prevent tampering. The model H valve operates on a simple displacement principle, and is spring backed. The pressure from the pump is utilized in forcing a measured shot of grease into the bearing, and when the pressure is relieved, the valves recharge for the next greasing cycle. Each valve functions independently and has an indicator to give visual evidence of discharge. Valves are adjustable to feed any amount of lubricant up to 0.4 oz. per shot. They may be made up into a block containing as many as four valves.

Fire Hose Nozzle

DISCHARGE of large quantities of water in the form of a discontinuous stream that is neither solid water nor a spray and that does not conduct electricity is possible with the Poweron fire-hose nozzle, recently developed by *American La-France-Foamite Corp.*, Elmira, N. Y. The Underwriters' Laboratories have approved it for use in applying water in fires in ordinary combustible material, flammable liquids, such as oils, and in electrical apparatus. Similar in size and appearance to the ordinary fire-hose nozzle, the Poweron nozzle is non-adjustable, preventing the formation of either a solid stream or an ineffectual spray. Its special form of discharge forms a water curtain between the operator and the blaze.

Fire Blanket

A FIREPROOF wool blanket, 80 in. long and so mounted that it can be wrapped tightly around one's body in a few seconds without assistance, is being marketed by the *Davis Emergency Equipment Co.*, New York. Normally, the Davis fire blanket is wound on a vertical roller, mounted on a wall or post. The worker thrusts an arm through a catch-rope attached to the exposed edge of

SPRAY coating of walls, ceilings, structural work and maintenance jobs is facilitated by a new type of extension handle for use with the heavy duty MBC gun made by the DeVilbiss Co., Toledo. The MBE extension is light in weight and is balanced. It consists of air and fluid tubes, held by clamps and soldered into a casting at the inlet end which also has the extension trigger. Standard lengths are 3, 4, 5, 6, 8 and 10 ft.



the blanket and, turning rapidly, wraps the blanket closely around him, thus extinguishing flames in his clothing or protecting himself from burns should he have to run through flames to safety.

Respirator Apparatus

AMONG the several new safety items recently introduced by the *Mine Safety Appliances Co.*, Pitts-



THIS quantitative dust and fume sampler, made by the *Mine Safety Appliances Co.*, Pittsburgh, employs the principle of pre-ionization with electrostatic precipitation. It has a sampling volume of 3 cu. ft. per min. permitting accurate determinations of very low concentrations of atmospheric particulate matter. Sample is collected in an aluminum tube, and determinations can be made by weight, count or chemical analysis.

burgh, is the M.S.A. lightweight 1-hr. oxygen breathing apparatus for respiratory protection in atmospheres containing concentrations of gases too high for safe use of canister type masks. Both mouthpiece and facepiece types are made, as well as a speaking diaphragm facepiece type. The wearing weight of the mouthpiece type is 18 lb. The apparatus consists essentially of an oxygen supply under high pressure, control valves, a cooler and rubber breathing bag, breathing tubes and mouthpiece, and a regenerator for purifying the expired breath and removing carbon dioxide from it. Standard equipment includes one oxygen cylinder, one charge of Cardoxide, a pair of nod-and-shake, gas-tight goggles, and canvas cap with or without bracket for holding an electric lamp. A double-seat oxygen valve is used.

Another new product of the same company is a line of hose masks supplied by the new M.S.A. blower. Positive displacement is employed in this blower, which is equipped throughout with permanently sealed ball bearings. A calibrated pressure release valve gives an audible signal when excess air over actual requirements is being delivered. The assembly also has a fresh air by-pass that allows the wearer to breathe easily through the hose in the event of blower stoppage. The blower is hand cranked, with vertical mounting for ease in cranking.

Two new instruments for dust sampling have also been developed by M.S.A. The electrostatic dust and fume sampler is illustrated. The midget impinger is a portable type, weighing less than 10 lb. Employing the accurate impinger method, it contains a hand-operated, four-cylinder pump, which in conjunction with a vacuum regulator maintains an unfluctuating suction regardless of unevenness in cranking. Nine calibrated glass sampling tubes are supplied with the outfit. Other new types of fume detectors include a methane tester, described in bulletin No. DN-3; benzol indicator, described in bulletin No. DM-3, and the hydrocyanic gas detector, details of which are found in bulletin No. DZ-1.

AN improved combustible gas indicator has also been recently announced by the *Davis Emergency Equipment Co.*, New York. This instrument measures directly the inflammability and explosability of gas-air mixtures. Improvements have been made to add to the convenience and reliability of the apparatus.

What Industrial Advertising Means To a Machine Tool Builder

THERE are a very few subjects on which you are likely to find so many self-qualified experts as on the subject of advertising. Most of us are like the lady at the Art Museum who said, "I don't know anything about art, but I know what I like!" Certainly that is one good reason why life isn't always too comfortable and rosy for you who are in and of the industrial advertising brotherhood. Moreover, it is the best reason I can think of why I, myself, should presume to address you on your own subject.

But I have another reason also. I am often called upon to approve advertising budgets and to pass on matters of advertising policy. And I want to assure you that no one can do that long without either getting a lot of faith in advertising or deciding to soft pedal it or abandon it altogether.

The fact that we, in my own company, are investing more and more money in advertising, year after year, in season and out of season, in good times and bad is proof that we have faith in industrial advertising. In that respect, I feel like the man who replied when he was told that advertising never put any hay in the barn, "Well, that's right; but neither did the sun!"

But there is one subject on which I am reasonably well informed and that is the subject of machine tools. To me, machine tools not only mean my own livelihood and most absorbing personal interest; they mean American industry and individual initiative and the modern way of living.

Machine tools are the master tools of industry. They are the only machines I know that reproduce themselves. By the same token, they are used to produce other kinds of machinery for the manufacture of the

By **WENDELL E. WHIPP**
*President Monarch Machine Tool Co.
and President of National Machine
Tool Builders' Association*

• • •

products and performance of services which make possible the American standard of living.

You all know about Eli Whitney; and doubtless think of him as the inventor of the cotton gin. But his



WENDELL E. WHIPP

most important contribution to our times was the principle of the interchangeability of parts, which is the foundation principle of mass production. He stated that his main objective was to make the same parts of a product assembly "as much alike as the successive impressions of a copper-plate engraving."

I don't need to tell you men that he

was successful and that this principle has been the basis on which most products in common use today have been brought within practical reach of millions.

All of you who live and work in one of the world's major machine tool centers know that there is a great deal to be said about the underlying significance of the machine tool industry. Much of it is being said very well indeed by the National Machine Tool Builders' Association in the form of various pamphlets that are issued from time to time. The current series of these pamphlets deals with such subjects as "Life, Liberty and the Pursuit of Happiness"; "Let Me Tell You About Machine Tools"; "More Goods for More People"; and, in particular, a new piece now in preparation about "Machine Tools and the National Welfare."

I have so far ventured to dwell on this subject of machine tools, because to me they are a symbol of industry itself and, as such, can also be construed as a symbol of industrial sales and advertising.

No one will deny, I think—certainly no industrial advertising man who is worth his salt will deny—that once you set a successful pattern for industrial selling, you have discovered much that you need to know in order to produce successful industrial advertising.

Machine Tool Selling Old Style

In that connection, I am reminded of a story told by a major executive in one of the old and outstanding companies in our industry. Not so many years ago, he said, he and his associates were dashing out of the plant on trips to various sections of the country in pursuit of orders. One of the founders of this very successful company dropped into his office one day, and said to him: "Why are all of you fellows leaving the office this way,

An address by Mr. Whipp before the Industrial Advertising Club of Cincinnati on Jan. 17.

and spending money to go outside for business?"

"Why," said the younger man, "the only way we can get business is to go out after it." To which the old chief replied:

"Well, I don't understand it. When Mr. Blank and I established this business, and for many years afterwards, people spent their own money and came to us when they wanted to buy machine tools."

And it is true that up until about the time of the World War machine tools were sold on a "demand basis," by engineers who could demonstrate and handle blueprints and let their customers take the machines away from them. But it doesn't happen that way any more; and in the meantime, many industrial concerns (including a goodly number in the machine tool industry) have changed their selling methods. They have discovered a newer and more successful pattern for selling industrial products and equipment—a pattern that even today could well be more generally applied.

Sales Application Engineering

Briefly, this pattern can be described as that of *sales application engineering*. It is the pattern used by salesmen who know that they must sell objectively; who study the customer's requirements—his production problems, and his need for cost reducing methods and devices; and then proceed to sell their equipment on the basis of applications engineered to meet that need. This applies primarily, of course, to production equipment as distinguished from tool room or standby equipment. But even in the latter case, the idea of application engineering holds good in terms of services that need to be rendered.

The best salesman who calls on us, for example, is a man who never comes in without a plan in his mind. As likely as not, he will want to visit a certain department. We know that he wants to visit that department because he has an idea. He frequently finds that a certain condition which he had anticipated actually exists. He calls it to our attention. He suggests a method for remedying it; and it often happens that he can suggest a way of remedying that condition by means of products and services that he has to sell. We have come to depend upon that man as a counsellor and friend. He has won our complete confidence, both in his own ability and in the ability of his house.

That man sells the profit his equipment can earn rather than just another machine. That man sells not gadgets or features or tricks or price; but ideas for doing a better job and for reducing costs. That, is *sales application engineering*.

A Selling Pattern for the Use of Industrial Advertising

If you happen to be enlisted among those who believe in the close relationship between advertising and selling, you will agree that here is a selling pattern that can be successfully followed also in industrial advertising. Following that pattern, to be sure, represents a radical departure from the old method of advertising merely by means of ballyhooing products and features. It is a pattern that recognizes the importance of advertising what is likely to interest the prospect.

Such advertising deals not so much with the product itself as with its uses and applications; not so much with generalizations as with specific cases in which the product actually did a job for some one else who had a common problem on his hands. It deals with the advertiser's facilities for rendering assistance to the customer in the analysis and definition of his actual operating requirements. It speaks in the language of accomplishment rather than in that of claims and promises.

I am aware, however, that advertising like that seems hard to achieve because we are so prone to follow the calf path of habit. We are too close to the products we make and the services we render. We are proud of our development and manufacturing accomplishments. We are too subjective in our reactions to our own place in the sun. We want to tell the world about it, and forget that the world we sell is from Missouri and has to be shown.

Advertising Application Engineering

But really, it isn't so difficult to demonstrate the merit of our products by means of applications even in advertising. It is only difficult if one is unwilling to invest advertising money in the procurement of materials out of which good advertising is built,—namely, pictures and application data and competent personnel. It is not difficult when you embrace a point of view which will permit you to go out into the market for what you need, even to the point of writing copy (almost literally) in the customer's shop. That point of view is based on a deep understanding of the fact

that you can't build good advertising or anything else worth while without good materials, good tools and good men, who think in marketing terms. It means that you will advertise, as you expect to sell, according to the rules of accepted marketing practice . . . according to the best methods of sales application engineering. That point of view is, in fact, an approach to industrial advertising that might be called *advertising application engineering*—advertising that is engineered to fit the best application experience.

But naturally, that isn't the whole story, because alert advertisers must keep on reminding themselves that they are advertising and selling in today's market. Well, what does that mean?

It means the ability and the will to engineer the advertising we do to the trends of industrial advertising today. What are these trends? In my judgment, there are two which stand out among the rest as most important, namely:

(1) The trend toward *measuring the effectiveness* of industrial advertising; and

(2) The trend toward recognizing industrial advertising as an *essential part of the public relations program*.

Measuring Effectiveness of Advertising

Let us examine the first of these trends; that is, the trend toward measuring the effectiveness of industrial advertising. This trend is the result of a challenge to industrial advertising in recent years, to "show cause" for its existence on an important scale. Well, how can that be done? The answer is comparatively simple—in principle, if not always in execution. It is based on a survey method, the purpose of which is to determine precisely where (as to reputation) an advertiser may "stand" in the market and in comparison with his competitors. These methods are particularly desirable for industrial companies that have been out of advertising for a time or that have never been in and where doubts are entertained as to their relative position market-wise.

Let me cite a case in point in which a "recognition test" was made both before and after an advertising campaign. It was made for one of the leading manufacturers of tool steel. This company had not advertised for several years, and had decided to start a campaign, but wanted to get the "before and after" picture.

You are doubtless familiar with the procedure employed. A questionnaire is sent out on the letterhead of an independent research organization. In this instance, the investigation was confined to the metal-working industry and these two questions were asked:

(1) Whom do you consider the leading manufacturers of tool steel? and

(2) If you were to change your source of supply, to whom would you change?

Before the campaign started, this steel company ranked 6th in answer to question number one and 5th in answer to question number two. The advertising campaign was carried on in several of the top papers in the metal-working industry; and this campaign was packed up by an appropriate direct mail program.

At the end of one year, the same questionnaire was sent to a similar list of names in the same industry. What happened?

Our steel company had moved up from 6th to 2nd position, as determined by the answers to question number one and from 5th to 1st position, as determined by the answers to question number two.

This is but one of many such cases that could be cited to show a method for measuring the effectiveness of advertising is practicable; and is available to advertisers who, very properly at times, come to doubt the efficacy of their advertising procedure, if not indeed the efficacy of industrial advertising itself.

As a result of such recognition tests, industrial advertisers who happen to be in doubt, need no longer decide to "do a little advertising" merely on hunch; but may go into a well-planned advertising program on the sound investment of factual market information.

Advertising in a Public Relations Program

Now let us examine trend number two. This is the trend toward recognizing industrial advertising as an essential part of the public relations program . . . which Edgar M. Queeny, president of the Monsanto Chemical Co. calls "business manners and morals." Chief executives everywhere are becoming increasingly conscious of public relations, which have three main objectives:

- (1) Better employee relations.
- (2) Better community relations.
- (3) Better customer relations.

Industrial advertising plays a primary role, of course, in better customer relations; and must be conceived and executed to build maximum goodwill.

The pattern for industrial advertising that I have been discussing should be made to tie in specifically with this trend toward recognizing industrial advertising as an essential part of the public relations program. But in my opinion, such advertising goes only part of the way. I am living for the day when it will be supplemented and amplified by a broader kind of advertising (call it institutional advertising, if you like), which proceeds on a programmed basis and over the long pull and in various ways (that is, with copy, written from any one of a number of different angles), deliberately to perform a reputation-building function.

It is perfectly true that many of us in the machine tool industry cannot do this job by ourselves, either wholly or even in part. But those of us who can undertake it and will do it intelligently and follow through on it vigorously, will find our reputations growing apace in proportion to the intelligence and the vigor of our efforts, and the relative size of our advertising investment. Even such advertising can find its proper place in the formula of *advertising application engineering*, because it is advertising that is engineered to the application of building a reputation of which you can be proud, throughout your immediate market and throughout the business community. It is the kind of advertising, more than any other, that stimulates constructive conversation about your company in the shop, on the street and in Pullman drawing rooms.

I said, a moment ago, that many of us could not undertake this latter kind of reputation-building advertising either wholly or even in part, by ourselves. If we do not, or cannot, who will?

My answer to that is a prediction that, both currently and during the next five years, this job is going to be done at an increasing rate by groups of manufacturers who have common public relations problems.

Take my own association of machine tool builders, for example. We are keenly aware of the need for a public relations program for the industry that is built on the common ground of selling a more favorable inclination toward that industry on

the part of machine tool users, the business community and the public generally.

In what I have tried to say, I believe you will find a practical approach to industrial advertising in today's market as well as an expression of my own viewpoint on what industrial advertising means to a machine tool builder.

It is my personal belief that the future belongs, in richest measure, to that manufacturer who is willing to adopt the pattern of *advertising application engineering* and who applies it in terms of public relations; to that manufacturer who is determined to find out, on an established survey basis, whether or not his own advertising is effective or on what terms it could be made effective; and to that manufacturer who is willing to invest, according to his means, in the idea of putting his industrial advertising to work as a reputation-building force.

Machine Tool Industry's Outlook Improved

THE 1939 outlook for the machine tool industry is better than was the case in 1938, August H. Tuechter, president, Cincinnati Bickford Tool Co., told the Lions Club at its meeting in Cincinnati, Jan. 18.

"If industry in general improves at all," Mr. Tuechter said, "there will undoubtedly be a heavy demand made upon the machine tool industry to replace equipment long since become obsolete. The replacement of even a small part of these machines will keep us all busy for a long time. It appears to us also that our foreign demand may continue through 1939."

Prospects for increased business in the industry, Mr. Tuechter pointed out, do not rest upon a possible program of national defense but depend upon expected upturn in our regular industries.

"It is generally assumed," Mr. Tuechter said, "that we, as an industry, shall benefit greatly from a rearmament program here. The fact is, however, that the dollar volume of business derived from Government orders for machine tools for the use of our armed forces represents only a small fraction of the total business of our industry, even when active programs for the strengthening of our defense structure are in progress. The machine tool industry is dedicated to the arts of peace."

Upturn in Machine Tool Sales Expected to Develop This Year

CLEVELAND — Encouragement is derived by machine tool producers and sellers from the upturn in domestic sales at the close of 1938, expected to presage stronger demand during this new year.

December statistics, recently issued by the National Machine Tool Builders Association, show that 1938 ended with a flourish of activity; that December was by far the best month of the year, and that it was the first month of the year to exceed the corresponding month of 1937.

The association's total index of orders rose to 146.5, against 112.2 in November, and 142.7 in December, 1937. The average for the year just closed was 102.8, which is 17.8 higher than the 20-year average of 85.0 per cent. While 1938 was spotty, it was about 17 points above the 1935 average.

December domestic volume was considerably stronger than November, giving impetus to the gradual uptrend in the domestic picture since last summer. December is usually a strong month, especially in a rising trend, but the increase was beyond the seasonal amount.

25 Per Cent Gain Expected

Conservative estimates place the probable 1939 increase in domestic sales at about 25 per cent. Even the most liberal forecasters cannot see the 1937 level being reached.

A speedy upturn, topped by two or three months of very good business, would not surprise some sales authorities. Other close observers hold that sales progress may be slow in the first quarter, followed by good business during the ensuing months of 1939.

Realizing that there are a number of unpredictables, such as political factors, all estimates are well qualified. At least a bare start toward a return of confidence appears to have been set off by the November election. Con-

gress holds the answer to further restoration.

One confident Middle West manufacturer has piled newly completed machines worth \$750,000 in the center of his plant. Such action would have been highly impracticable one year ago.

Tools Needed in Many Industries

Shipbuilding, aircraft and automotive requirements are counted upon to set the pace, and machine tools are badly needed in countless other industries where production is increasingly necessary and where old, time consuming equipment is hard pressed competitively.

Users have indulged in only a very limited amount of replacement buying, as such, in recent years. While some very ambitious replacement programs were engineered and estimated, and are ready to be released, the general practice has been to confine purchases to single machines required for specific jobs. Consumers' surpluses would permit no more than buying of the most necessary kind. Consequently, outmoded machines of the pre-war era are still cutting metal in many plants where better production is imperative to offset the higher costs of heavy taxes and shorter hours.

However, there are definite indications that at least a few replacement programs will get under way in 1939.

Airplane Needs to Expand

An increase in this nation's airplane manufacturing facilities will react beneficially to the machine tool industry, both directly and indirectly through parts makers. The aircraft market was very good through most of 1938.

Shipbuilding and ordnance work helped provide impetus in the latter part of last year and are expected to be a major domestic market in 1939 for machine tool and press manufacturers.

In the automotive field, since the 1939 models did not involve extensive changes necessitating new machinery, it is hoped buying for the 1940 series will be heavier.

Whether the railroads will be able to contribute much this year to the machine tool industry remains an open question. Rehabilitation of the carriers' equipment is greatly needed, and if given any help at all the roads will do some equipment buying, very little being necessary to exceed last year's activity.

So many prospects are outstanding, some of them long dormant, that a serious delivery situation could arise easily if all users came into the market at once.

Metal Cleaning and Finishing Economics

(CONCLUDED FROM PAGE 28)

It is the lack of such accurate records which has made it difficult heretofore to prepare any data of value on the economic angle of metal cleaning and finishing. Fortunately management has been experiencing a change of heart on this matter of late, and in many plants cleaning and finishing operations have been set up from the point of view of the cost-accountant, as though that particular department of the business were a separate, outside concern. Thus, in many plants, for the first time there are actual records which may be regarded as trustworthy, and in which costs of cleaning and finishing are completely segregated from all other production costs.

Because of this fact, the articles to follow will be based on reliable economic data, and it is the hope of the Editors of THE IRON AGE that readers may find in them the bases for an intelligent approach to their own problems.

THIS WEEK

ON THE

ASSEMBLY LINE

By W. F. SHERMAN
Detroit Editor

... Change in auto body interior forecast with leaf spring seats likely to replace coil springs ... Auto production registers third weekly gain, passing 90,000 mark ... Used car inventories down 18 per cent, new car stocks 35 per cent under a year ago.

DETROIT.—Automobile output registered another substantial gain in the last week when production rose over the 90,000 mark. This is the third consecutive gain, each week of 1939 having been better than the preceding one. At the same time, the industry gained strength in the knowledge that new and used car inventories are substantially below those of a year ago.

The next model year undoubtedly will be marked in the annals of automobile history as marking a turning point in the design of automobile interiors. Impending changes in the manufacture of automobile seats, trim and instrument panels have been revealed recently.

A Detroit manufacturer is preparing to introduce a new type of automobile seat weighing at least 15 to 20 per cent less than the seats in use today. In it, light-weight leaf springs replace coil springs. The design is perhaps the only real innovation ever offered in automobile seating.

The new type will have only 28 to 30 leaf springs in it compared with 90 to 100 coil springs now in use in each seat, including cushion and seat back. The springs used in these seats are approximately 1½ in. wide steel strip about 0.030 in. thick. They are mounted on tubular frames much like those used underneath the fabric of some automobile seats at present. Heavy stamped frames are easily eliminated in this design.

The leaf springs are of a variable rate type, providing the same "ride" for the 100 lb. passenger and the 250 pounder. Besides offering softer, controlled cushioning, the leaf springs have much more rapid damping action, permitting only one and one-half to two oscillations, approximately, until the motion of the spring ceases. This does away with one of the greatest difficulties experienced with "soft seats" which jiggle the passenger up and down many times before equilibrium is restored.

For taxicabs, busses and trucks where rough useage frequently reduces cushion life to six months or a year, it is anticipated that the leaf spring seat will provide indefinite life because the great area of metal in contact with padding and fabric prevents breaking through. If these seats are adopted, it will mean soft truck seats for the first time in the history of the industry. Previously, service requirements necessitated so much stiff and heavy padding that the truck departments of automobile companies frankly gave up any attempt to provide real comfort.

Weight Saving a Factor

Weight saving is probably one of the most important factors in consideration of these seats. If necessary, engineers say, the leaf spring design would result in savings of 25 to 40 per cent weight. It is not generally realized that the front seat for a pas-

senger car weighs 100 lb. plus. In one case of record, a light streamlined bus body was equipped with conventional seats which weighed more than the entire seatless body. Both passenger car manufacturers and the bus-truck industry have long looked for a method of decreasing seat weight. Sample seats of the new type have been built for inspection and test by engineers of several automobile companies.

The design is easily adapted to covering with padding and fabric like most present-day seats, or with air-foam rubber, recently introduced for automotive use.

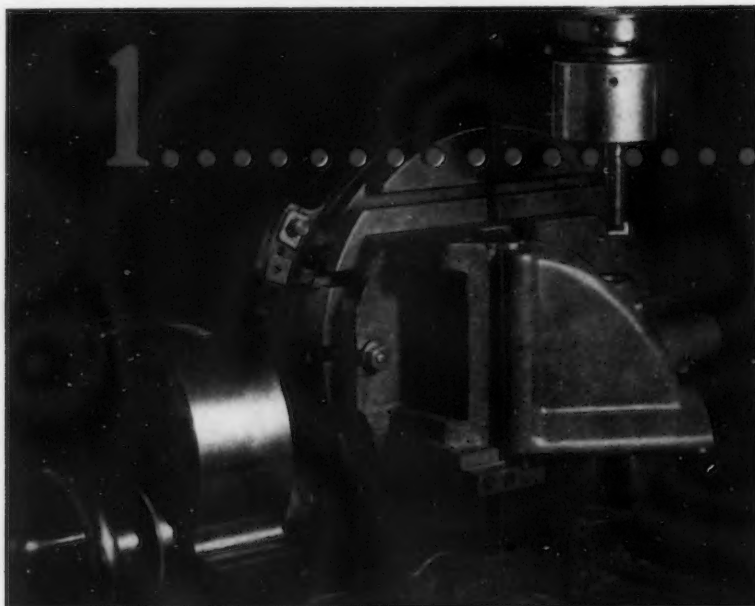
Another indicated advantage is an increase in passenger room because the seat back, not being stuffed with coil springs, is concave, adding to the available space for rear seat passengers. Something like 2 in. has been gained experimentally in foot room by design of a new toe-board footrest in connection with the new seats.

The new seats offer interesting opportunities for designers to provide unusual upholstery with removable seat covers and inexpensive combinations of trim and upholstery colors. This trend is already indicated by a few special body set-ups, generally in the more expensive cars.

Research on Plastics Continues

Other features of the interior which will get a great deal of attention as new models are prepared for next year are plastics for instrument panels, glove compartment doors, steering wheels, etc.

At the recent annual meeting of the Society of Automotive Engineers, display panels depicting many combinations of colors for trim and plastic panels were shown by Monsanto Plastic Co. Also, it is known that the major automobile companies are con-



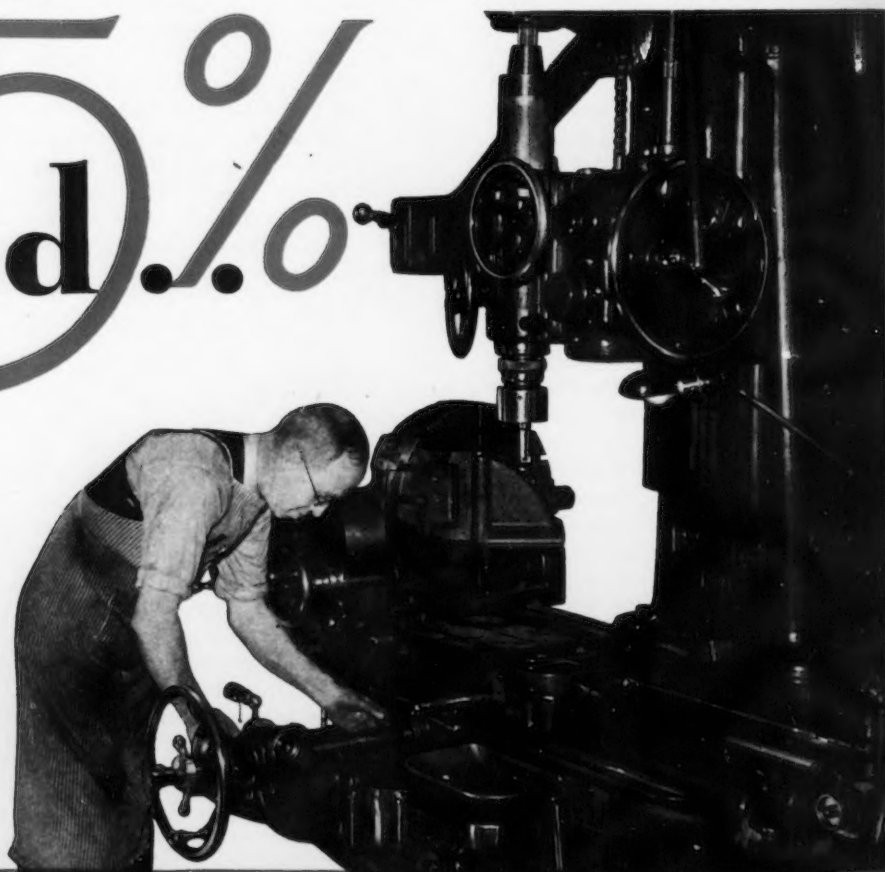
This is a typical example of the many savings made in small lot manufacturing with the P&W Jig Borer.

Hole No. 1

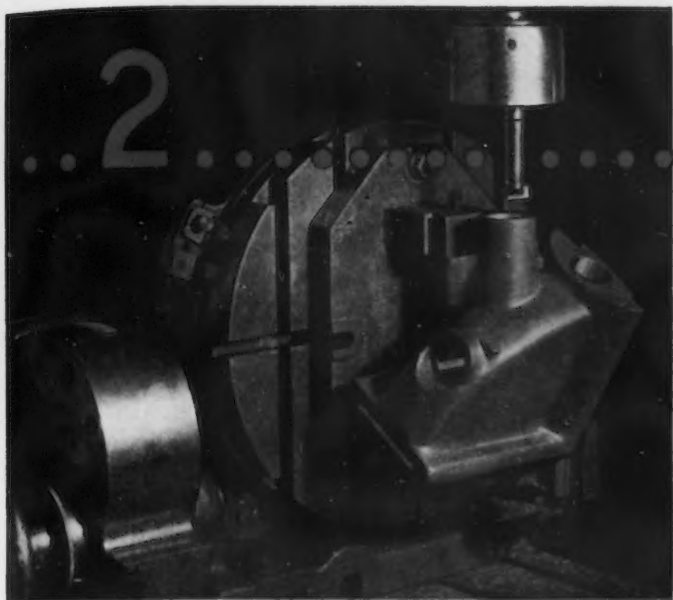
The work is mounted on a simple fixture on the tilting rotary table. It is easy to line up the first hole under the spindle to "tenths," using the Jig Borer built-in measuring instruments. Hole No. 1 is single point bored to size with the tilting table vertical.

Another job done on the P&W JIG BORER!

75% Saved.



PRATT &



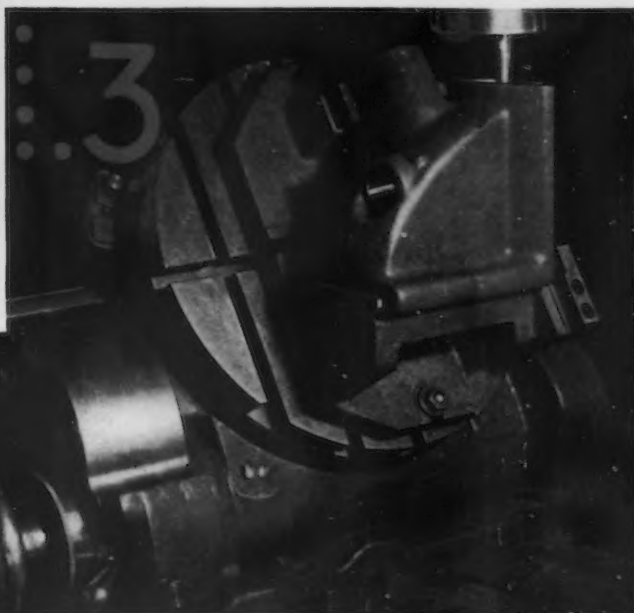
Hole No. 2

Rotating the table 90° in its vertical position brings the second hole under the spindle, using the table vernier for accurate setting. Notice the fine precision finish obtained in all holes with a properly ground single point tool.

Hole No. 3

This position is obtained by tilting the table back thru the necessary angle, using the vernier for accuracy. The built-in measuring instruments provide the correct cross travel to line up the hole accurately with the spindle. Single point boring does the rest.

The job is finished—and final assembly is precise and easy. Each piece averages 15 minutes floor to floor. Notice the tolerances given below.



Study this job for a minute to see how *you* would do it. There are thirty pieces, each with three holes about 3 inches long and 1½ inches in diameter, with axes at odd angles. You must hold the job within .0002".

In our own shop we use the Pratt & Whitney Jig Borer with a tilting rotary table and a simple fixture. Our combined tooling and work costs are 75% less than with conventional fixtures on a horizontal boring machine. The job averages five minutes per finished hole, floor to floor. Can *you* beat it?

Would you like to have literature on Pratt & Whitney Jig Borers? There is no obligation. Write today.

W H I T N E Y

DIVISION NILES-BEMENT-POND CO.
HARTFORD, CONNECTICUT

tinuing with research on plastics. Ford's soy bean experiments have borne fruit, it is generally known. It is not so widely known that one group of engineers at Chrysler is studying plastics machines with a view to developing a type which will permit the manufacture of panels much larger than are feasible now.

An indication of the attention that Pontiac Motor's new Duflex rear springs are attracting everywhere was shown at a recent exhibit of the Automotive Service Industries in Chicago. Every spring manufacturer featured variable rate springs, according to C. P. Simpson, general sales manager of Pontiac Motors. There were seven spring exhibits in all. The Leaf Spring Institute had a similar exhibit at the New York Auto Show.

Week's Output 90,205 Units

Automobile production during the last week reached a level 38.1 per cent ahead of the corresponding week of last year. According to Ward's Automotive Reports, the total output was 90,205 units compared with 65,418 a year ago, and 86,925 in the previous week.

The increased output is taken to be a reflection of the fact that retail sales are holding up at a better-than-seasonal rate. The upturn was contrary to seasonal expectations and was made despite the handicap of wintry weather.

Chrysler's return to five-day schedules in several plants was the major factor in the advance, but all along the line the tendency to larger output had its effects. Chrysler's total was up to 23,310 units from 20,860 a week ago. Plymouth registered an increase from 9740 to 10,580. Chevrolet and Ford output continued unchanged from the levels of the previous week, although the General Motors volume as a whole increased from 35,196 to 35,440.

A week ago no estimate of the total number of used cars on the market was available for the industry as a whole. However, since that time, the National Automobile Dealers Association has completed a thorough investigation of the condition of the sales outlets. After investigating the inventories of 725 dealers in every section of United States, NADA reports:

Used car inventories of automobile dealers as of Dec. 31, 1938, were approximately 18 per cent lower than those for the same date one year previous, while new car stocks were reduced almost 35 per cent. Current used car stocks averaged 41 units per dealer, an estimated 45-day supply in the present market. A summary of dealer opinion regarding present car stocks shows:

	New Cars	Used Cars
Overstock	0.8%	61.0%
Normal	72.2%	35.5%
Understock	27.0%	3.5%

It is evident that while 61 per cent of the dealers believe there is a overstock of used cars and 35.5 per cent regard used car stocks as normal, opinion is overwhelmingly registered on the point that new car stocks are normal, or below normal.

Thus, from the automobile sales forces of the nation there is substantiation of the opinion stated emphatically in the Assembly Line last week that manufacturers are not over-producing for the present market. Actually, there is real evidence that sales are leading production, even in mid-winter.

Despite the reduction in unit inventories as compared with a year ago, the NADA survey points out that many dealers state that their used car dollar inventories are not reduced proportionately owing to the fact that current stocks represent a larger percentage of later model, higher priced used cars. The average dealer reporting in the survey is about three times larger than the average of all automobile dealers, according to the survey report which estimates national used car stocks in the neighborhood of 650,000 units at the present time. A year ago they were estimated at approximately 800,000 units.

Studebaker Wins Economy Race

Hot on the heels of the news that Studebaker would introduce a new light car, the 1939 Studebaker Commander won this year's annual Gilmore-Yosemite Economy run, covering 315 miles in a road race with less gasoline than any other car, except the Willys-Overland. Studebaker's actual "miles per gallon" was checked at 25.779 in comparison with Overland which sent one car over the route at an average of 26.208 miles per gal. Studebaker averaged 28.63 miles per hr., completing the 315 miles in 10 hr., 59 min. Studebaker's supremacy over the Overland was based on the fact that the race formula of ton-miles per

THE BULL OF THE WOODS

BY J. R. WILLIAMS



gallon gave Studebaker a final rating of 55.875, whereas the lighter Overland finished at 42.720 ton-miles per gallon.

Best time for the race was 9 hr. 51 min., accomplished by a Dodge Special. The race this year was marked by the fact that 13 cars out of 29 stock cars in the race were disqualified for taking more than 11 hours to complete the run. The extra time used up by these cars ranged from one minute to 31 minutes.

Of course, in each price class there were individual winners on the basis of economy. Thus, in respective groups, first place winners were Willys-Overland, Oldsmobile 60, Nash-Lafayette, Chrysler, the Studebaker Commander which won the sweepstakes, the Studebaker President, Packard 120, and Lincoln Zephyr.

Frazer Goes to Willys

Willys-Overland last week made another bid for progress in securing the services of Joseph W. Frazer, a Chrysler executive for 15 years, who assumed the presidency and general managership of the Willys organization. He succeeds David R. Wilson, who has retired after completing the reorganization and rehabilitation of the company. Mr. Wilson will continue as a director.

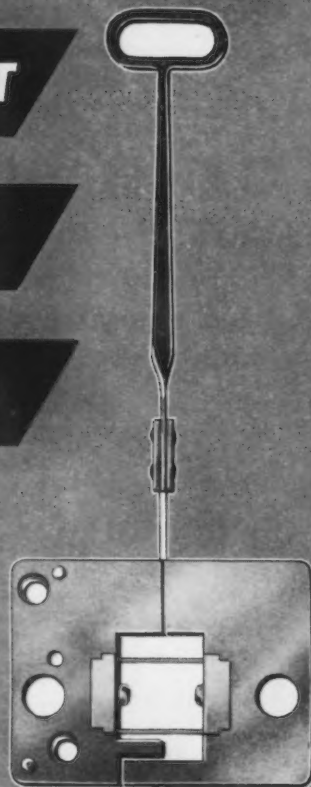
In rapid succession in the last year or so, Willys has appointed Delmar G. (Barney) Roos as vice-president and chief engineer; Floyd F. Kishline, engine expert; William C. Cowling, general sales manager. All are noted in the automotive field. Roos, formerly of Studebaker, returned from a position in England to accept the Willys post. Kishline left Graham Paige, where he had charge of the design of the supercharged engine, to go to Toledo. Cowling went from the sales managership of the Ford Motor Co. to join the reorganized Willys firm.

Frazer started in the shop of an automobile company 26 years ago and since 1924 has been intimately associated with Walter P. Chrysler in the development of first the Maxwell and then the Chrysler Corp. He was elected sales manager of Chrysler Corp. in 1927 and since has held various titles, including vice-president of Chrysler Sales Corp., of the Chrysler Corp., Plymouth Corp. and DeSoto Corp. Prior to joining Chrysler he organized and ran the Pierce Arrow Finance Corp. of Buffalo, and prior to that for several years was with the Chevrolet Export Division and General Motors Acceptance Corp. His experience covers manufacturing, sales and financial departments of the automobile business.

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THIS WEEK IN WASHINGTON

... State Department still opposed to scrap embargo despite some popular sentiment for such legislation ... Measure designed to repeal Wagner Act introduced ... Wage-Hour law administrator sees 250,000 getting pay raises in October.

WASHINGTON—Despite rising popular sentiment for licensing or embargoing exports of pig iron, iron and steel scrap, it is indicated that the State Department continues to be opposed to legislation of this kind. Small steel producers who at the previous session of Congress urged scrap licensing legislation have not so far resumed their effort or intimated that they will do so. Those who want legislation enacted, however, are hopeful of developing such a strong demand for it as to enforce action by Congress either with or without Administration approval.

Nevertheless the belief prevails here that the Administration will remain opposed to and forestall the legislation if the issue is pressed. At the same time it is realized that there have recently been set up powerful forces which are conducting nationwide campaigns to bar shipments of war materials to all or to particular warring countries.

Stimson Committee Acts

An outstanding group of this kind is the American Committee for Non-Participation in Japanese aggression. Headed by former Secretary of State Henry L. Stimson, the committee is made up of distinguished American citizens and has been organized to promote legislation to check the flow of American credits and war materials to Japan. The committee specifically mentioned scrap iron, steel, oil and trucks as materials whose shipments to Japan it wants stopped.

Opposition by dealers to restriction on scrap exports continues as strong as ever. If there is likelihood of legislation, an effort may be made to have all products made from scrap covered. Obviously this would mean practically all steel products.

Senator Schwollenbach (Dem. of

Wash.) has reintroduced a bill to bar exports of scrap plate, except upon license issued by the President. Undoubtedly if the bill were pressed for enactment it would be broadened to include all iron and steel scrap. On the House side, Representative Crawford, Republican of Michigan, has reintroduced a joint resolution providing that whenever the President issues a proclamation under the Neutrality Act declaring an embargo on exports of arms, ammunition or implements of war he shall include scrap iron and pig iron.

Mr. Crawford also has introduced a bill which would prohibit the exportation of pig iron, scrap iron and scrap steel, except under license from the Secretary of Commerce. The Secretary could grant a permit only upon application certifying that the scrap or pig iron is not to be used in the manufacture of implements or for military purposes.

No Hearings Scheduled

As yet no hearings on any of these have been arranged. Supporters of the measures do not know whether there will be any hearings but believe that if sentiment for such legislation becomes strong enough hearings will be forced.

Senator Thomas (Dem. of Utah), and chairman of the Senate Military Affairs sub-Committee which last session handled the proposed scrap licensing legislation, told THE IRON AGE that there was little possibility for hearings this year on the various licensing and embargo bills. He said he saw little change in the situation since last session when the sub-committee took no action on the proposals but indicated that because of the national defense issue the committee would continue to study the matter just to keep up to date on developments.

There were indications that both War and Navy Departments would express their approval of scrap licensing bills, as they did last session, but there were no signs that either department would go out of its way to press for passage. Officials of the departments said that their opinions had not been requested on the pending bills this session but that, if asked, their recommendations would substantially follow those made last year.

United Aircraft Gets \$1,676,250 Air Corps Job

WASHINGTON—The War Department has announced that the Air Corps has awarded a \$1,676,250 contract to the Hamilton Standard Propellers division of the United Aircraft Corp., East Hartford, Conn., for propeller assemblies and controls. The Quartermaster Corps also awarded a \$3,263 contract to the Chevrolet division of the General Motors Corp., Detroit, for four 1-ton canopy express trucks.

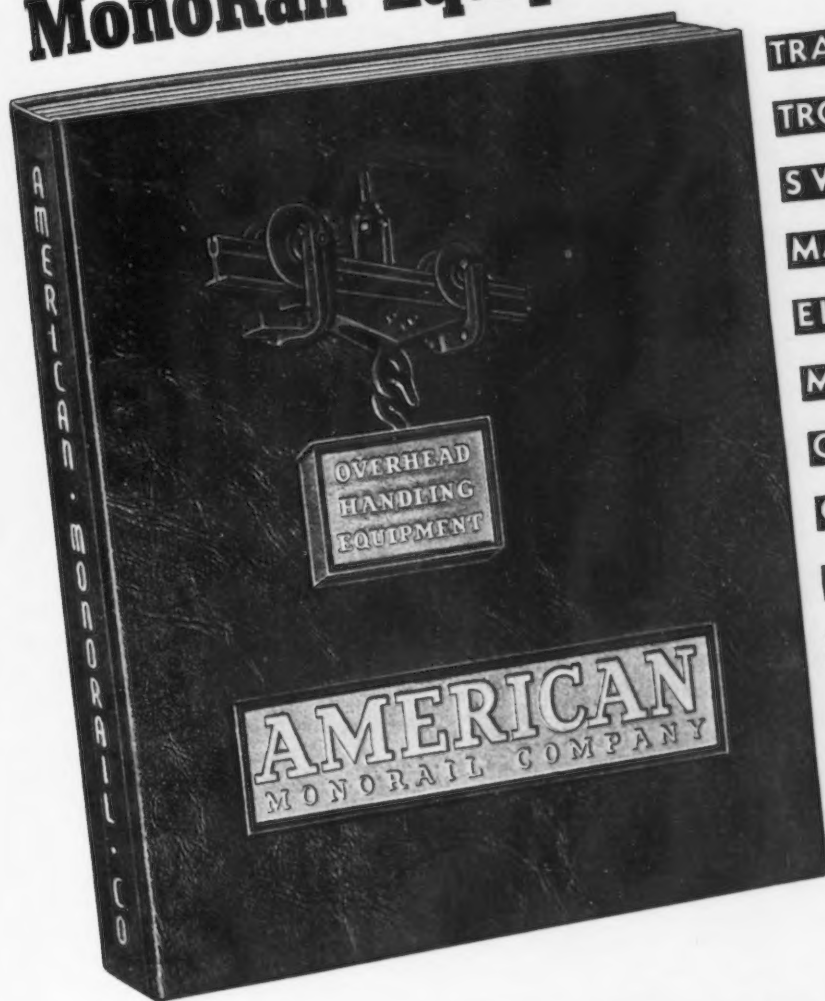
Awards made by the Ordnance Department totaled \$647,958 and were allocated as follows:

For the special machinery program—American Machine & Metals, Inc., New York City, \$175,725 for acid nitrocellulose centrifugals; Henry Prentiss & Co., Inc., New York City, \$1,278 for a vertical drill press and \$6,900 for one internal grinder; and the Mattison Machine Works, Rockford, Ill., \$15,404 for one hydraulic feed surface grinder.

For the inspection gage program—Polhemus Co., Chicago, \$1,096 for gages for 75mm gun carriages; the Taft-Peirce Mfg. Co., Woonsocket, R. I., \$14,545; Barker Tool, Die & Gage Co., Detroit, \$2,517; Standard Gage Co., Inc., Poughkeepsie, N. Y., \$1,101.

For the artillery and small arms program—Breeze Corporations, Inc., Newark, \$106,302 for automatic gun (37mm) control equipment and spare parts; and \$304,302 for similar equipment for the .50 M.G. caliber automatic gun; Stowe Mfg. Co., Inc., Binghamton, N. Y., \$18,786 for flexible shaft and casing assemblies.

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Wage-Hour Law Simplification, State Acts Sought by Andrews

WASHINGTON — Broadening of the wage and hour law to include intrastate industries by dovetailing legislation in all 48 states, and simplification of the Federal law without changing its fundamental principles, are the Administrator's primary objectives for 1939 as the Labor Department's wage-hour division swings into its fourth month of operation under the Fair Labor Standards Act.

Estimating that 300,000 workers have already been affected by the law's minimum wage provisions and that 250,000 additional workers will enjoy pay increases when the 30c. minimum rate goes into effect Oct. 24, Administrator Elmer F. Andrews last week placed the number of employees whose work week has been shortened by the 44-hour week, or who have been getting time and one-half for overtime, at 1,384,000.

Andrews, appearing before the annual meeting of the Council of State Governments, insisted that the reforms contemplated by the wage-hour law will not be complete until protection is afforded the workers in intrastate industry. This is in line with the policy adopted by the Administration ever since the law was put on the statute books. A great deal of spade work is understood to have been done in the direction of getting states to pass their own minimum wage and maximum hour laws.

Bar to Improvement

A barrier to improvement of labor conditions, state by state, the administrator told the conference of State officers, has been "the fear of endowing unregulated enterprise with commercial advantages." He advanced the suggestion that grants-in-aid to the states to improve their labor departments be instituted by the Federal Government to make them "better able to participate in the increasingly complex and important task of administering labor legislation."

His plan would be to avoid over-centralization of Government by insisting upon a division of Federal-State control and at the same time provide "for the effective regulation of inter-dependent problems by a skillful blending of authority."

Andrews, who has been having difficulty selecting a suitable case to take to court because, as he explained it, "most everybody is complying with the law," told a House Appropriations Sub-committee a few days earlier that his division had received about 6200 complaints of non-compliance, most of which involved border-line cases. He recommended that Congress, without attempting to alter the principles of the law, simplify the act.

He referred specifically to that provision prescribing penalties, which in most cases are retroactive, for employers found violating the law. He suggested that both the division and industry would be better off if after violations were uncovered the individuals acting on the advice of the division would "be relieved from any retroactive action in any court in the way of awarding back wages." The administrator said that employers can be advised by the division on some questions but that there is always the possibility "that the courts might overrule us."

Czechoslovakian Pig Iron Output Up in November

WASHINGTON — Czechoslovak production of pig iron during November, 1938, amounted to 70,000 metric tons, an increase of 18.6 per cent over the October figure of 59,000 tons, according to reports received by the Commerce Department. During the same period, the crude steel output increased 13.1 per cent, or from 84,000 metric tons in October to 95,000 tons the following month.

NLRB Issues Order Against Greer Steel

WASHINGTON—The National Labor Relations Board has announced an order and stipulation requiring the Greer Steel Co., Dover, Ohio, "to end efforts to interfere with self-organization of its employees and to stop discouraging by any means membership in Tuscarora Lodge No. 173 of the Amalgamated Association of Iron, Steel & Tin Workers or any other labor organization."

Bill to Repeal Wagner Act Is Offered in House

WASHINGTON — A bill designed to repeal the Wagner Labor Relations Act and to take away from the National Labor Relations Board its powers of "judge and jury" was introduced in the House of Representatives last week by Congressman C. Arthur Anderson (Dem. of Mo.) who said he saw little chance of improved business conditions until the Wagner Act is made to comply with "the fundamental principles of justice and fair play."

Representative Ramspeck (Dem. of Ga.), ranking member of the committee, announced that while he favored modification of the Wagner Act, he was not in sympathy with the Missouri congressman's measure.

There were indications that other members of the committee, including Chairman Mary T. Norton, who last session successfully handled the Administration's wage and hour measure, concurred with Ramspeck. The AFL has its own ideas about what should be done in the direction of revising the law and the possibilities for that organization lifting a helping hand to aid the Anderson bill are remote. On the contrary there is generally recognized to be within the AFL a definite segment of members who see eye to eye with the CIO and who can be depended upon to squash any tendency within the organization to move in the direction of Wagner Act revision along the lines desired by business.

Would Curb NLRB Power

The Anderson measure would leave intact the NLRB's powers of acting as investigator and prosecutor; that is, the board could make inquiry and hold hearings and on the basis of its findings file complaints charging violation of the law with the United States District Court but its powers would end there. The District Court would decide the case, issue such orders as would be necessary for rehiring employees or giving them back pay or for carrying out whatever acts the Court decided should be done.

Another provision of the bill, described by the Congressman as "an important feature," would curb the Labor Board's power to arbitrarily certify any union as the exclusive representative of employees without first holding an election among the workers to determine in all cases their choice in the matter. Until the employees were given an opportunity to hold an election, the board could not



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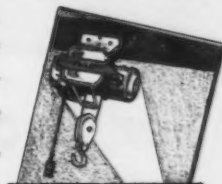
The reason is simple. AIR-COOLING saves the operator money. The basic limiting factor in electric hoist construction has always been excess brake heat. When Yale engineers adapted the special sirocco blower action that would cool the brake frictional parts they, for the first time, made it possible to eliminate this heat.

That's the principle of AIR-

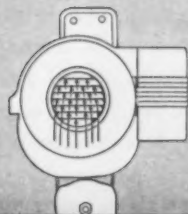
COOLING—a principle that permits the Cable King to operate on a heavier duty cycle than any other hoist in the same class. And that means greater economy than any other hoist in the same class!

In addition, the precision construction of the Cable King makes it the closest approach to perfect engineering specifications that has ever been built. AIR-COOLING plus mechanical perfection—that's what you get in the Cable King. It's the very latest advance in hoisting equipment.

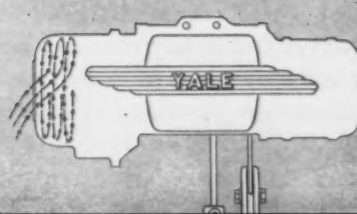
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STARTLING AND EXCLUSIVE AIR-COOLING PRINCIPLE...



The Greatest Economy Factor Ever Developed in Electric Hoist Construction.



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PHILADELPHIA DIVISION, PHILADELPHIA, PA., U. S. A.
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take action against an employer for alleged failure to bargain with a union.

Strategic Mineral Bills Introduced in House

WASHINGTON — Restricting purchases to domestic supplies when they are available in the necessary quantity and quality, Representative May, Democrat of Kentucky and chairman of the House Committee on

Military Affairs has introduced a bill for the purchase and storage of "strategic minerals," for national defense. It differs from the bill sponsored by Senator Thomas (Dem. of Utah), and chairman of a Senate Military Affairs Sub-committee, in that the latter measure would not limit the source of supply to domestic production.

As pointed out in *THE IRON AGE* of Jan. 19, page 52, the Thomas measure is understood to have the support of both War and Navy Departments. A

similar bill also has been introduced in the House by Representative James G. Scrugham (Dem. of Nevada). Another measure just launched by Representative Faddis, Democrat of Pennsylvania, provides for the purchase of "strategic and raw materials, concentrates and alloys essential to the needs of industry for the manufacture of supplies for the armed forces and the civilian population in time of national emergency. . . ."

All the pending measures suggest an appropriation of \$25,000,000 a year for the purchase of the so-called strategic and critical materials.

Representative May, who does not claim Administration support for his bill, referred specifically to such metals as manganese, tungsten, tin and others in explaining the purpose of his measure. Storing would be under the direction of the President on military and naval reservations and the reserves could only be used during war time or when specifically directed by the President on the pretext of a national emergency.

Government Steel Awards Increase

WASHINGTON—Contracts for iron and steel products aggregating \$1,817,744.19 were awarded under the Walsh-Healey Act during the week ended Jan. 14, while machinery contracts amounted to \$216,081.65 and Government purchases of electrical apparatus and supplies totaled \$555,542.22. Details follow:

Iron, Steel Products

The Midvale Co., Washington, steel slides	\$486,500.00
Bethlehem Steel Co., Bethlehem, Pa., castings and slides	21,600.00
St. Louis Steel Casting Co., St. Louis, carbon steel castings	16,192.00
William Scrimgeour, Washington, tableware	35,910.80
Wheeling Corrugating Co., Wheeling, W. Va., roof decking	13,460.00
The Ohio Seamless Tube Co., Shelby, Ohio, steel tubing	53,084.29
Steel & Tubes, Inc., Cleveland, steel pipe	70,747.36
Bethlehem Steel Export Corp., New York, steel concrete reinforcement bars	35,562.50
Carnegie-Illinois Steel Co., Washington, steel shapes	Indefinite
Worth Steel Co., Claymont, Del., plates, sheets, etc.	223,000.00
Thomas Gregory Galvanizing Works, Maspeth, N. Y., plates	82,000.00
Enterprise Galvanizing Co., Philadelphia, beams	11,625.00
Alan Wood Steel Co., Conshohocken, Pa., plates, strips	85,000.00
Worth Steel Co., Claymont, Del., plates	71,000.00
Bethlehem Steel Co., Bethlehem, Pa., angles	22,000.00
Enterprise Galvanizing Co., Philadelphia, angles	10,000.00
Carnegie-Illinois Steel Corp., Washington, angles	Indefinite
Allegheny Ludlum Steel Corp., Brackenridge, Pa., steel, sheet	20,933.50
Steel & Tubes, Inc., Cleveland, extractors, cartridge case	41,427.00



For Loading and Unloading

Trucks in these busy zones can load or unload quickly and easily with P&H Trav-Lifts operated by pendant rope or push-button control. These cranes, designed for intermittent duty, are low in cost—available in any size and capacity up to 15 tons—provide the same movement of loads as continuous duty cranes. P&H Trav-Lift Cranes are described in Bulletin H-13. May we send your copy? Harnischfeger Corporation, 4401 W. National Ave., Milwaukee, Wis.

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HOISTS • WELDING ELECTRODES • MOTORS **P&H** EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

The Taft Peirce Mfg. Co., Woonsocket, R. I., propeller serv. equip.	15,550.00
Sheffield Steel Corp., Kansas City, galvanized wire	29,329.24
American Chain & Cable Co., Inc., Wilkes-Barre, Pa., wire rope	12,103.00
Rochester Ropes, Inc., Jamaica, N. Y., cable	10,476.75
American Chain & Cable Co., Inc., Hazard Wire Rope Div., Wilkes-Barre, Pa., cable	33,144.40
Wire Rope Corp. of America, Inc., New Haven, Conn., wire rope	23,778.60
E. H. Edwards Co., San Francisco, wire rope	27,180.28
Gary Steel Products Corp., Norfolk, Va., buoys	19,188.00
Carnegie-Illinois Steel Corp., Chicago, miscellaneous steel	33,837.87
John Wood Mfg. Co., Inc., Conshohocken, Pa., boxes	285,310.00
Pressed Steel Tank Co., West Allis, Wis., shells, blank	27,803.60

Non-ferrous Metals and Alloys

The Andrews Lead Co., Inc., Long Island City, N. Y., lead	\$11,636.06
The International Nickel Co., Inc., New York, nickel-chromium-alloy	10,575.00

Machinery

Allis Chalmers Mfg. Co., Milwaukee, Wis., tractors	\$11,882.92
Jones & Lamson Machine Co., Springfield, Vt., mach., grinder	16,143.68
H. R. Krueger & Co., Detroit, drilling mach.	12,800.00
Cincinnati Milling Machine & Cincinnati Grinders, Inc., Cincinnati, milling mach.	18,067.05
The Lodge & Shipley Machine Tool Co., Cincinnati, lathes	40,670.00
The R. K. LeBlond Machine Tool Co., Cincinnati, lathe	10,389.00
The Cincinnati Shaper Co., Cincinnati, shears	14,213.00
Bay City Shovels, Inc., Bay City, Mich., shovel	14,500.00
Worthington Pump & Machinery Corp., Harrison, N. J., pumps	35,900.00
Northern Pump Co., Minneapolis, Minn., pumps	30,800.00
Ransome Concrete Machinery Co., Dunellen, N. J., concrete mixers	10,716.00

Lake Superior Ore Book Published

CLEVELAND—"Lake Superior Iron Ores," a book compiled and published by the Lake Superior Iron Ore Association, Cleveland, containing comprehensive data on the iron mining industry and one of the most complete records of mines ever issued, is now available.

Nothing similar has been printed. This first edition consists of 412 pages, size 8½ by 11 in., and contains the history of the industry, geology, mineralogy, classification and sampling, grading, preparation for market requirements, shipment and reduction, a directory of mines, double page maps of the ranges, a flow map in colors, and various other tables and charts.

Among the statistical data are shipments, starting with the year 1854; distribution and consumption of ore, analyses, reserves, prices, taxes, freight rates, world iron ore production, and imports of the United States.

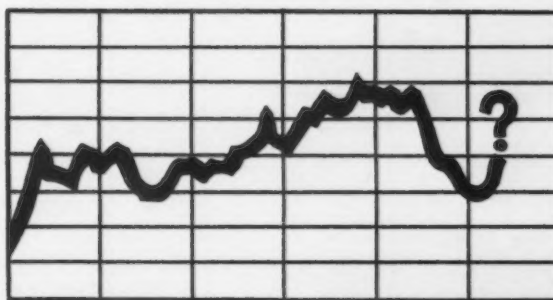
M. D. Harbaugh, secretary of the association, edited the work which is to be revised and reissued at intervals of about three years. The book is priced nominally at \$5.

Lewis Foundry Announces Sheet Mill Streamlining

LEWIS FOUNDRY & MACHINE DIVISION of Blaw-Knox Co., Pittsburgh, announces a new improvement in its Lewis 3-high sheet mill. By streamlining of the mill tables, the rolling capacity of the mill is increased from a range of 1600 to 1800 pairs per 8-hr. turn to an output of 1700 to 2000 pairs.

Kalamazoo Stove Buys Walker & Pratt Mfg. Co.

FINAL details are being arranged for taking over the Walker & Pratt Mfg. Co., Watertown, Mass., by the Kalamazoo Stove Co., Kalamazoo, Mich. The Watertown company was founded more than 80 years ago. The Kalamazoo company plans to give immediate employment to 200, and eventually 500 persons.



How High is UP?

If your sales aren't at the peak you have a right to expect, ask yourself that question. The trouble may not be the amount of money you spend for advertising—but how you spend it. Our work with successful clients has demonstrated that the *right kind* of advertising can make the advertising budget work overtime—make the expenditure a profitable investment.

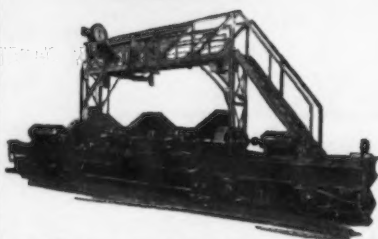
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Special Cars and Electrically
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conceivable purpose.

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Engineers - Manufacturers

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Revere Copper Builds \$3,250,000 Mill at Rome, N. Y.

REVERE COPPER & BRASS, INC., has completed a \$3,250,000 brass and copper mill at Rome, N. Y., as part of a large modernization program which has included expenditures for rolling mills equipped with anti-friction bearings, conveyors, automatic pickling, cleaning and annealing equipment. As a result, said C. Donald Dallas, president, sheets and strip are rolled more accurately to gage and surface finishes have been so improved that manufacturing plants have been able to eliminate some fabricating operations and turn out better products.

Revere's new mill at Rome incorporates latest innovations in straight-line production in the copper and brass industry. The mill has a monthly capacity of 2,000,000 lb. of brass strip up to 20 in. in width and is contained within a floor area of 72,000 sq. ft.

Escalator Conveyor

Innovations include a new escalator conveyor system whereby the brass slabs are automatically fed and re-fed into the breakdown mill, each sequence being controlled by a series of electric eyes. A continuous conveying system carries the slabs through an annealing furnace and back to the rolling mill or to the scalping machine, thus eliminating the usual method of loading and unloading pans.

The scalping machine eliminates surface imperfections in one operation, replacing former methods. First rundown after scalping is done on new four-high and two-high mills operated in tandem. An 80-ft. straight-line pickling machine patented by Revere uncoils, pickles, scrubs, washes, dries and recoils the brass in one continuous operation. Annealing furnaces of new recirculating and recuperative types, give the metal predetermined physical characteristics through automatic controls.

Other New Equipment

The new brass mill is adjacent to Revere's copper rolling mill in Rome, N. Y., built in 1929, and having a monthly capacity of 10,000,000 lb. of sheets and strip up to 48 in. in width. This installation includes four stands of four-high rolls operated in tandem and thus is the largest continuous mill in the industry. Other new equipment at Rome includes automatic bright

annealing furnaces, a new horizontal tube extrusion press, tube reducers, and a 120-ft. high speed draw bench designed by Revere engineers for tubing.

Revere has installed a new fast four-high continuous rolling mill in its Dallas division plant in Chicago which rolls up to 900 ft. of thin-gage material per minute and other rolling mill equipment has been fitted with the latest type anti-friction bearings. The Michigan division at Detroit has been completely revamped so that production is on a straight-line basis all the way from the slab casting shop through the breakdown mill, annealing furnaces, four-high mill in tandem, continuous picklers, and finishing stands. A few months ago, Revere combined production facilities at Taunton, Mass., with those at New Bedford, Mass., with the exception of equipment for rolling heavy plates. An entirely new mill for drawing small-diameter tubing in long lengths has been installed at the Baltimore plant.

What Consumers Should Know About "Piped" Steel

AN interesting little leaflet has been issued by the Acme Steel Co., Chicago, under the title "Piped Steel."

While the average loss to steel users because of "piped" steel is less than one thousandth of one per cent, according to the leaflet, this defect is not always avoidable. Those unacquainted with the process of rolling strip steel may have assumed that a "pipe" at one end of a coil should call for the rejection of the order since the discovered defect would prevail in all of the material. Such procedure often inconveniences the consumer and unduly penalizes the steel producer, since such defects, discoverable only in working, exist in only the first few feet of the occasional coil in which they occur.

The origin and nature of "pipes" in flat rolled steel are explained in the leaflet in text and illustration.

Keystone Steel & Wire Co. reports for the three months ended Dec. 31, 1938, a net profit of \$115,728, equivalent to 15c. a share on 757,632 shares of capital stock. This compares with net of \$32,226 for the same period of last year, equivalent to 4c. a share. For the six months ended Dec. 31, net profit amounted to \$198,952, equivalent to 26c. a share on the capital stock, compared with \$235,919 or 31c. a share for the same period of 1937. A substantial improvement in shipments which began in November has continued thus far in January, according to Henry G. Sommer, executive vice-president.

G.E. Domestic Boilers Are Electrically Welded

(CONTINUED FROM PAGE 39)

main housing and upper structure are of welded steel.

Only the upper roll is driven, but the pressure developed is sufficient to drive both the work and the lower roll. A two-step treadle is used to control the cycle. The initial step brings the upper roll down to the work and the second step closes the welding circuit and starts the rotation of upper roll. The machine then proceeds to weld the periphery of the circular seam. By substituting a different lower arm in the knee of the machine and revolving the upper arm 90 deg., the same machine can be set for welding straight seams, such as the longitudinal side of a furnace wall or any ordinary flat work.

A portable gun spot welder mounted on an overhead gantry is available for attachment of small sub-assemblies, not easily reached with a formal fixture set-up.

Arc Welding Fixtures

Arc welding is performed with the aid of G-E a.c. welding transformers and power rotated fixtures, Fig. 5. The flat heads are first tacked in place and then the assembly is placed on the fixture table, with the axis of the drum about 30 deg. to the vertical. Control of the fixture driving motor is by a treadle. G-E type 20 and type W-23 coated electrodes are used. These give results comparable with machine welding. Using this technique, the operator bends the rod roughly to the shape of the arc of the drum and lays the rod on flat. This method eliminates all unevenness due to variations in arc length, were the operator to attempt to use a freehand motion in laying down the bead.

These welded drums must meet the standard A.S.M.E. boiler code specifications and are subjected to hydrostatic pressure tests not only as a final inspection, but also during the course of sub-assembly welding. Fig. 6, for example, shows an inner shell with attached flue pipes being tested under water pressure. At this stage of construction, any pin holes can readily be detected and repaired with the metallic arc or simply by peening. At a later stage of assembly, such a repair might result in practically scrapping the entire boiler. As can be seen, the test fixture itself is a welded structure.

The Bill for Interruptions in Performance comes high

Accurate Springs keep things running smoothly

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SMALL STAMPINGS
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An ability to solve knotty spring difficulties ... to get customers out of holes ... has gained B-G-R the confidence of many spring users. B-G-R helps you to design the *right* spring ... and the combined resources of two complete plants see to it that *your* schedules are maintained.



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WHEN YOU
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• Out of our stock of 30 million cap and set screws you can always get prompt shipments for these stocks are maintained in a full list of sizes at all times. Set screws with Flat, Cone, Dog, Cup, Round and Oval points are available—and all are made to usual Cleveland Cap Screw standards, a Class 3 fit. Threads are very accurate, heads true, and all of our Set Screws are case hardened by the most modern heat treating equipment existing. Ask for samples. Catalog E and price list on request. **THE CLEVELAND CAP SCREW COMPANY**, 2929 E. 79th Street, Cleveland, Ohio.

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CLEVELAND CAP SCREWS
SET SCREWS • BOLTS AND NUTS

New "Loaded" Irons Have Important Properties

LONDON—The properties and possibilities of an important new range of high-duty gray cast irons suitable for cylinder liners, piston rings and other important engineering castings, and known as "loaded" irons, were described by H. J. Young in a recent address before the Institution of Marine Engineers, London. Mr.

Young stated that the new materials (which have been developed by the Sheepbridge Stokes Centrifugal Casting Co. Chesterfield, England) can be manufactured with normal equipment in any iron foundry, but metallographic control is essential. Their structure is all-pearlitic and they can be used in the as-cast condition without heat treatment.

The loaded-iron process departs altogether from the idea of maintaining a low silicon percentage in the

iron, and any silicon content from 2.5 per cent to about 7 per cent can be employed. For example, many castings have been made with silicon contents of between 4.5 and 5.5 per cent. These contents are "stabilized" by high chromium of from 1 to 4 per cent, or more, being made according to the silicon content chosen and the section of the castings concerned, an all-pearlitic structure being insured. The silicon and chromium in the irons can be replaced, wholly or partly, by nickel, copper, molybdenum and manganese and, if desired, small additions of rarer elements, such as tungsten, vanadium, and titanium, can be made.

The new irons can be cast centrifugally, in sand or metal molds, and in a variety of other ways, and the Brinell hardness number rises with the silicon content without rendering the irons unmachinable. For example, large cylinder liners for marine work have been manufactured of loaded irons with Brinell hardness values ranging from 300 to over 400. The irons are very heat-resisting and of such composition that their physical properties remain unimpaired by thermal conditions which would break down a normal engineering iron. As the silicon increases, the irons become more brittle, but a tensile strength of 34,000 lb. per sq. in. is obtainable on material of 5 per cent silicon content.

These loaded irons have unusual properties during foundry pouring operations: they lie placid in the ladle and do not splash or spark when poured. The castings produced are noticeably free from such defects as slag inclusions and blowholes, and machined surfaces are difficult to distinguish from those of steel. Taken altogether, loaded irons, the possibilities of which are still being investigated by technologists, are materials, it was said, capable of giving marked improvement in a number of industrial applications without excessive cost.



When Production Executives Think in Terms of Results The Choice is OILGEAR

There is room in American Industry for all grades of equipment. But production men who are affiliated with the *leaders*, think only on one level—quality production demands quality equipment.

Hence it is vital to note that in a great business machine house, a great electrical manufacturer's plant, one of the most widely known consumption goods manu-

facturers—that in these and *all* other leading plants, Oilgear Broaches, Presses, etc. have the call.

For the logic of cut costs, reduced maintenance, faster operation, bettered production points clearly and unmistakably to the *superior* Oilgear Machine. THE OILGEAR COMPANY, 1303 W. Bruce St., Milwaukee, Wis.

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BROACHING MACHINES AND PRESSES

Sudetenland's Minerals Will Aid German Steel Industry

LONDON—The issue of the annual report of the German State-owned Reich-Kredit-Gesellschaft makes it possible for the first time to appraise the economic consequences of the annexation of the Sudetenland by Germany.

Among the minerals of special importance with which this territory can provide Germany are iron, antimony (required by Germany for the manu-

facture of shrapnel bullets), manganese, tungsten and nickel. All these metals are badly needed by Germany for the production of various types of steel, but none of them have been produced in very large quantities in the Sudetenland. However, the report asserts that there are possibilities of extensive development of these mineral resources now that the territory has been ceded to Germany.

British Air Raid Shelters To Take 1,650,000 Tons Steel

LONDON—Sir John Anderson, Minister in charge of Civilian Defense, has announced in the House of Commons plans providing, at a cost of £20,000,000 (\$100,000,000), to be borne entirely by the Exchequer, for the protection in private air-raid shelters of 10,000,000 of the poorer sections of the population.

The steel industry anticipates that most of the £20,000,000 will be spent on colliery arches, standard sections, sheets and thin plates. Assuming an average cost of £12 (\$60) a ton, the plan represents 1,650,000 tons of steel, which is equal to 16 per cent of 1938's total output of 10,500,000 tons. The project is therefore of major importance to the industry, which is now operating around 65 to 70 per cent of capacity. In addition, substantial orders can also be expected from industry, which is to be called upon to provide protection for its employees while at work.

British Steel Output Lowest in Four Years

LONDON—United Kingdom steel production totaled 655,700 tons in December, the lowest monthly figure for four years. This brought 1938 production to 10,394,000 tons, or 80 per cent of 1937's record of 12,984,000 tons. The December figure compares with 860,000 tons in November and 1,103,800 tons in December, 1937.

Pig iron production in December totaled 445,800 tons, bringing the yearly total to 6,736,000 tons, or 79 per cent of the 1937 output of 8,493,100 tons.

New Zealand is to Spend \$25,000,000 on Steel Plants

LONDON—The New Zealand Government has been authorized by the Dominion Parliament to spend £5,000,000 (\$25,000,000) on establishing an iron and steel industry. The

new industry will, according to Premier Savage, constitute one of the principal features of the Government's industrial expansion, if the supplies of iron ore prove satisfactory. The field in the Onekaka district is now being surveyed.

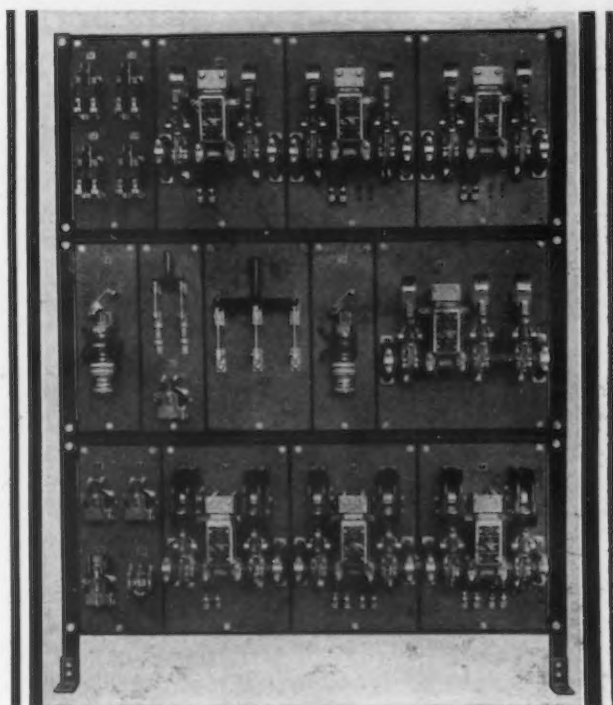
Italy Short of Steel For Non-Armament Purposes

LONDON—The reason for the recent loans of German railroad rolling stock to Italy is stated to be

the acute shortage of metal in the latter country for rebuilding the necessary railroad cars. The burning of the 28,000-ton Swedish liner Stockholm while under construction at the Monfalcone yard Trieste, has also raised the problem of procuring sufficient steel to rebuild her.

Recent orders issued by the Italian Government forbid the use of iron and steel in house building. This is in order to save metal for rearmament and to speed up the effort for national self-sufficiency.

Hyper-Synchronous Lowering Speeds for A. C. Crane Hoists



EC&M Frequency Relay Magnetic Control with counter-torque lowering is a new control which not only increases crane-handling-ability by faster lowering speeds but in addition, provides a much greater degree of controllability on all counter-torque lowering points. In the past, A. C. hoists have been limited to approximately synchronous motor speed in the lowering direction, but with this new EC&M Control, hyper-synchronous speed (50% faster) is now possible. Inching operations in the down direction are also improved with this control.



HEAVY DUTY MOTOR CONTROL
FOR CRANES, MILL DRIVES AND
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Please send me further information on the EC&M Frequency Relay Magnetic Control with Counter-torque Lowering for a
.....HPVoltphasecycle A. C. Wound Rotor Motor.

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Ohio Steel Foundry Reports New Hollow Roll Casting Method

SUCCESS in a method of casting hollow alloy steel rolls, with removal of the core said to be accomplished with speed heretofore unattained, is announced by the Ohio Steel Foundry Co., Lima, Ohio. In difficult applications, the rolls have shown

great reliability, T. H. Harvey, vice-president of the company, says.

The advantages of having holes cast through the center axes of large steel rolls have been recognized for some time, but the drawback was that cores used became impregnated with the steel forced between the interstices of the sand by the high temperature and tremendous pressure. Removal of the core was very difficult on a commercial basis. Discussing the "Holl-O-Cast" rolls, Mr. Harvey re-

cently cited the following advantages:

"1. Reduction of ingotism and center line weakness. The rapid solidification of large rolls is promoted by a smaller cross section of metal and is aided by the chilling action of the core. This results in a finer grain structure throughout, as cast, which is more easily broken up by heat treatment.

"2. Internal hot rupture which sometimes occurs in the bodies of large steel rolls is positively eliminated.

"3. Better heat treatment is made possible because heating and annealing stresses are diminished and a more drastic quenching of the roll bodies is permitted. Harder bodies, more refined structures, and denser metal are desirable factors in large rolls and especially important in backing-up rolls to improve resistance to spalling.

"4. Greater fatigue resistance is provided. Ultimate failure of solid backing-up rolls has often been attributed to fatigue cracks that develop in the necks. Improved resistance of the hollow necks to fatigue brings about better economy when backing-up rolls have given a full life and are then ready to turn down in order to use them as mandrels for sleeves."



This Erie Steam Hammer is forging crankshafts for a large truck manufacturer.

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THIS one is forging crankshafts in the plant of a leading truck manufacturer... today's low cost transportation is possible because of economies such as Erie Steam and Board Drop Hammers effect in forging parts vital to motor-car stamina... 36 years' building dependable hammers qualify Erie as your logical choice... Write for bulletins 325 and 328 with full details on Erie Steam and Board Drop Hammers.

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ERIE BUILDS Dependable HAMMERS

Build Plants in Britain, Low Advises U. S. Industry

AMERICAN manufacturers have constantly increasing opportunities to extend the scope of their operations by establishment of plants in Great Britain, Albert S. Low, vice-president and chief engineer of the Austin Co., engineers and builders, said following his return after eight months in Europe, during which he established Austin Engineers Building, Ltd., with a permanent organization in London.

"Records of earnings made by the many manufacturing subsidiaries of American companies already operating there proves not only the desire of the English people for our products but also demonstrates the practicability of adapting our production methods to existing conditions," he said. "It is the policy of the British Government to encourage new industries to locate plants there, particularly in the areas where a surplus of labor is available."

The Charles C. Lewis Co., Springfield, Mass., is opening a branch warehouse at No. 80 John Street, Hartford, Conn., to start operations the latter part of January. It will stock steel bars, shapes, plates, sheets and cold finished material.

... OBITUARY ...

P. J. WARD, who had been works manager of the American Steel Foundries, East St. Louis, Ill., for over 34 years, died on Jan. 10, at his home in East St. Louis, after an illness of two months, aged 66 years.

He was born in St. Charles, Mo., and had been associated with the foundry industry for over 50 years, starting in the iron foundry of the Wabash Railway at Moberly, Mo. He became affiliated with the Shickle, Harrison & Howard Iron Works, which later became a part of the American Steel Foundries in 1897, and continued with the American Steel Foundries until his retirement on account of ill health, on Jan. 1. He worked as a molder, foreman, and shop superintendent before taking the position of works manager in 1904.

♦ ♦ ♦

FRANCIS H. CLERGUE, first president of the Algoma Steel Corp., and at the time of his death president of the Universal Engineering Corp., Montreal, Canada, died of heart disease in a Montreal hospital on Jan. 19, aged 82 years. Early in his career he became interested in the railroad industry and was instrumental in organizing the construction of the first electric railway in Maine. About 1895 he went to the area around Sault Ste. Marie and engaged in developing the power industry, later constructing hydraulic canals and power plants on the Canadian and United States sides of the St. Mary's Fall. On organizing Algoma Steel Corp., he became its president.

♦ ♦ ♦

C. WOOD WALTER, vice-president of the Cincinnati Milling Machine Co. until his retirement in 1925, died of pneumonia at his home in Cincinnati on Jan. 16. Besides writing numerous articles on trade and economic subjects, Mr. Walter found time to serve for many years as a director, vice-president and chairman of the traffic committee of the National Machine Tool Builders Association.

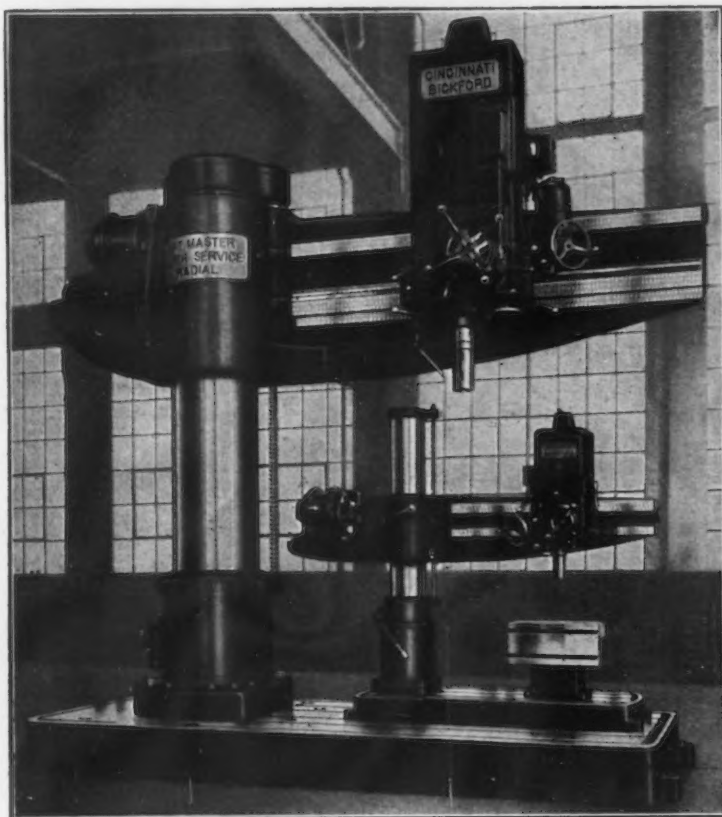
Mr. Walter was born in Cincinnati Aug. 31, 1866. After graduation from Woodward High School he attended Wooster College, where he was graduated in 1888 with the degree of bachelor of arts. For the next 12 years he was engaged in the publishing business. In 1900 he entered the machine tool business with the milling machine company.

♦ ♦ ♦

MORITZ KAHN, vice-president of the firm of Albert Kahn, Inc., architect

and engineer, was found dead in his berth, Jan. 16, on a train arriving at the Grand Central Terminal in New York from Detroit. Death was ascribed to a heart attack. Mr. Kahn was born in Echternach, Luxembourg, and came to America in 1881. He was graduated from the University of Michigan as a civil engineer and began his career with the American Bridge Co. in Detroit in 1903. A year later he joined the Trussed Concrete

Co. and was sent to England to organize a company in 1905. From 1906 to 1923 he served as managing director of the English firm, Trussed Concrete Steel Co., Ltd. In October, 1923, he returned to Detroit and joined the firm of his brother, Albert. To the field of construction work Mr. Kahn made several contributions. Mr. Kahn spent considerable time in Russia, where his firm acted as chief designers in the Soviet Union's industrial program. His first trip was in 1931.



Fast Handling,
with **CENTRALIZED** Controls

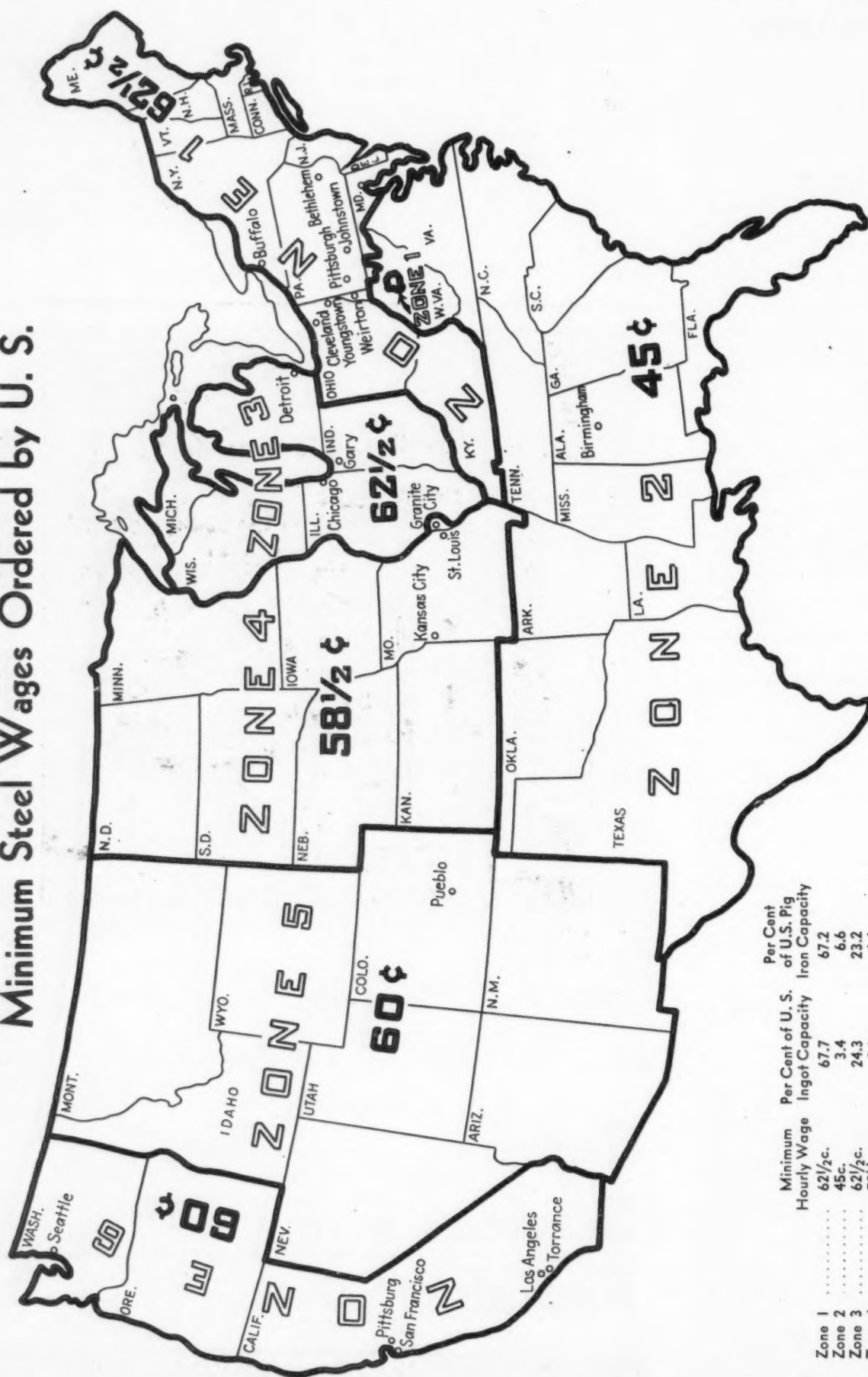
**Super-
Service
Radials**

Super-Service Radials, in 3' to 12' sizes, are 1939 tools in every particular. Of special importance is the centralizing of all controls at the head, with constant speed driving motor, a.c. or d.c. Gear change box at rear of arm and costly variable speed motor are thus eliminated.

Everything is arranged for the operator to work faster and with less effort. A truly modern accomplishment! Write for details.

THE CINCINNATI BICKFORD TOOL CO.
OAKLEY CINCINNATI OHIO U.S.A.

Minimum Steel Wages Ordered by U. S.



The Iron Age	Zone	Minimum Hourly Wage		Per Cent of U. S. Ingot Capacity		Per Cent of U. S. Pig Iron Capacity	
		62 1/2c.	45c.	67.7	3.4	67.2	6.6
	Zone 1	62 1/2c.	45c.	67.7	3.4	67.2	6.6
	Zone 2	62 1/2c.	45c.	24.3	2.1	23.2	1.6
	Zone 3	62 1/2c.	45c.	2.1	1.2	1.4	1.4
	Zone 4	58 1/2c.	60c.	1.3	1.3	None	None
	Zone 5	60c.	60c.				
	Zone 6	60c.	60c.				

The Iron Age

This map, prepared by THE IRON AGE, indicates the minimum hourly wage rates prescribed in various steel-producing areas by the U. S. Department of Labor. The rates, effective Jan. 31, are shown with percentages of the national steel ingot and pig iron capacities in those districts.

... THE NEWS IN BRIEF ...

Two thousand industrial and transportation leaders are expected to attend the 38th annual dinner of the Pittsburgh Traffic Club, Jan. 27.

Railroads paid \$9.70 taxes in 1938 out of each \$100 received for transportation of passengers, freight, other services.—Page 31.

Inland Steel Co. acquires Wilson & Bennett Mfg. Co., Chicago, metal container manufacturer.—Page 31.

Standard Steel Spring Co. opens new electroplating plant at Coraopolis, Pa., for nickel plating large sections of steel.—Page 36.

American companies join British concerns in building new abrasive plant for metal-working industry in Australia.—Page 36.

Change in auto body interior forecast with leaf spring seats likely to replace coil springs. Auto production registers third weekly gain, passing 90,000 mark. Used car inventories down 18 per cent, new car stocks 35 per cent under a year ago.—Page 49.

State Department still is opposed to scrap embargo despite some public sentiment for such legislation.—Page 54.

United Aircraft Corp. gets \$1,676,250 order from War Department for propeller assemblies and controls.—Page 54.

Wage-Hour Law Administrator seeks act's simplification, sees 250,000 getting pay increases by Oct. 24.—Page 56.

Pig iron production total for Czechoslovakia shows increase during November.—Page 56.

National Labor Relations Board issues order in favor of CIO against Greer Steel Co.—Page 56.

Measure designed to repeal Wagner Act introduced in House; unlikely to win strong support.—Page 57.

Contracts for iron and steel products awarded by Federal Government in latest reported week total \$1,817,744.—Page 58.

Strategic mineral bills introduced in House.—Page 58.

Lake Superior Iron Ore Association issues 412-page book containing complete information on iron mining industry.—Page 59.

Kalamazoo Stove buys Walker & Pratt Mfg. Co.—Page 59.

Lewis Foundry & Machine division of Blaw-Knox announces improvement in Lewis three-high sheet mill.—Page 59.

Revere Copper & Brass, Inc., completes new \$3,250,000 brass and copper mill at Rome, N. Y.—Page 60.

What consumers should know about "Piped" steel.—Page 60.

New "Loaded" irons have important properties.—Page 62.

Sudetenland's minerals will aid German steel industry.—Page 62.

Italy short of steel for non-armament purposes.—Page 63.

British air raid shelters to take 1,650,000 tons of steel.—Page 63.

New Zealand is to spend \$25,000,000 on steel industry.—Page 63.

British steel output lowest in four years.—Page 63.

Ohio Steel Foundry Co. announces new method of casting hollow alloy steel rolls.—Page 64.

Foundry Equipment Manufacturers Association postpones its annual meeting, originally scheduled for Feb. 14, until fall.—Page 64.

Austin Co. executive urges American companies to expand earnings by building plants in Great Britain.—Page 64.

Germany orders 500,000 tons of South African ore.—Page 89.

Machine tool inquiries show an increase in volume in most districts. Orders about holding former levels.—Page 90.

Missouri-Pacific to spend \$110,755 for machinery.—Page 90.

B. F. Fairless praises the "American way" of doing business, tells canners' convention their industry is result of system of free enterprise.

Extension of Labor Department's steel wage order effective date is considered unlikely; small companies protest.

General Electric Co. plans \$2,500,000 building for its Chicago headquarters.

Ogdensburg Shipbuilding & Dry Dock Co. is lowest bidder on 4000-ton cargo ship.

Second questionnaire for monopoly committee use is mailed to steel industry.—Page 79.

Pittsburgh plant workmen fight way through CIO dues collectors; union men stage sitdown.—Page 79.

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MEETINGS

Feb. 9 to 11—Conference of iron, steel and allied industries, Del Monte, Cal.
Feb. 14 to 17—Purchasing Agents Association, Indianapolis.
April 26 to 29—Electrochemical Society, Columbus, Ohio.

Small Companies Seek Delay In Government Steel Wage Order

WASHINGTON — Clarification of the Labor Department's steel wage order as a guide in making government steel purchases was asked by the Treasury's Procurement Division this week as Assistant Secretary of Labor Charles V. McLaughlin announced he would call a staff meeting "within a day or two" to consider what action should be taken on the request for a 60-day delay asked by the committee of small Eastern producers.

Consider Lukens' Request

Mr. McLaughlin indicated that the department also would consider the request of the Lukens Steel Co., submitted by Robert W. Wolcott, president, who expressed the view that study of the new rates "definitely indicates discrimination against the Eastern area and the many small producers located therein." Mr. Wolcott's letter asked for a 90-day delay so that additional time is allowed for studying costs, necessary adjustments and possible consequences of the order.

At the same time, Representative Francis E. Walter (Dem. of Easton, Pa.) characterized the steel wage order as "absolutely contrary" to the plainly expressed intent of Congress. Mr. Walter has introduced a bill which would amend the law to permit persons aggrieved by an order to petition for review.

Small Companies Ask Delay

Twenty-nine small iron and steel producers in the East, through Roberts B. Thomas, an attorney, asked the Department of Labor to delay until April 3 the effective date of the minimum wage schedule.

"The increase in wages for Government work required under the order is a very important item," the attorney wrote. "In practically every case the increase will be at least 10 per cent. All my clients are small concerns, and the record in this matter clearly shows that they cannot afford such a general wage increase."

The possibility for advancing the effective date of the order as a result of the request from the Procurement Division was minimized by Labor Department officials. It was pointed out that the Public Contracts Division re-

gards the final steel wage order as requiring little, if any, clarification.

Stipulation Urged

The revised determination submitted to the Secretary of Labor by the Procurement Division, which acts as the purchasing agent for most Government departments, pointed to the necessity of plainly stipulating in the order that "sheets," for example, mean steel sheets and not some other type of sheets. It was also understood the Procurement Division interprets the order as not covering galvanized sheets.

Would Re-advertise

Labor Department officials said that, in the case of steel companies which have recently bid on Government contracts and included in the bid a proviso that the estimated price would not apply if a steel wage decision was handed down before the contract was awarded, the Government purchasing officers would take cognizance of the higher wage costs resulting from the steel wage order and re-advertise for bids.

With reference to the products of open hearth and electric furnace operations made by members of the machinery and allied products industry, which were exempted under the steel wage order if the products are made for their own consumption, Labor Department officials explained that in the event such products in excess of their own requirements are sold to the Government, then the minimum steel wage rates prescribed in the order are applicable.

Sees Plants Closed

Representative Walter, who was one of the original sponsors of a bill providing for labor standards to be followed by Government contractors, told THE IRON AGE that it was his understanding that many small steel companies will no longer attempt to obtain Government business and that in some cases the order will operate to close the plants completely.

"I feel that the steel wage order was absolutely contrary to the plainly expressed intent of Congress," Mr. Walter said. "It unquestionably will work a growing hardship on small companies not only in my district but in other sections of the country affected." He said that these observations were based on numerous confer-

ences he has had with Eastern producers.

Would Provide Relief

His bill, which he said was sponsored "to meet the situation we're confronted with today," would permit any party aggrieved by a minimum wage decision of the Secretary of Labor to obtain a review by petitioning any United States Circuit Court of Appeals within 60 days after a decision was announced, asking that the order be modified or set aside.

Walter Bill Retroactive

On the basis of any additional evidence submitted after the case was ordered reviewed, the Secretary of Labor or a representative could modify the findings, make new findings and recommend modification or setting aside of the order if found necessary, and these would become conclusive if "supported by the preponderance of the evidence in the record." The court could then affirm, modify or set aside the Secretary's order, subject to review by the Supreme Court.

The Walter bill, after passage, would be retroactive. A steel company, for example, could petition for relief from the steel wage order under the machinery outlined in the measure by acting within 60 days after the law becomes effective.

Navy Department Announces Awards

WASHINGTON—The Navy Department has awarded a \$297,590 contract to the Industrial Piping & Engineering Co., Baltimore, for oil-fired boilers and appurtenances for the Pearl Harbor, T. H., Navy Yard. A contract for \$112,280 also has been awarded to the Rust Engineering Co., Pittsburgh, for the superstructure of a shop extension at the Norfolk, Va., Navy Yard. The Navy Department's Bureau of Supplies and Accounts has awarded a \$99,242 contract to the National Malleable Iron & Steel Casting Co., of Cleveland, for chain, steel and fittings for mooring units. The R. K. LeBlond Machine Tool Co., of Cincinnati, was awarded a \$23,040 contract for lathes and one engine.

Pittsburgh Coke & Iron Co., reports net earnings for 1938 of \$216,773, equal to 19c. a share on common after preferred dividends, compared with \$806,728 or \$1.20 a share in 1937. Fourth quarter earnings in 1938 were \$40,517, equal to 2c. a share on common.

"American Way" Best, Fairless Tells Convention of Cannery

THE canning industry, which drew 10,000 to Chicago for the National Cannery Association's 32nd annual convention, is "an impressive example of what may be accomplished under a system of free enterprise," Benjamin F. Fairless this week told the convention.

"The impact of competition often provides the force which sends an industry in the direction of wider knowledge and better products," the United States Steel Corp. president said. "Supplementing these factors there is the profit motive, for men must live by the results of their endeavors, and funds must be provided to furnish the sinews of business."

"The fact that each industry is energized by those motives is a guarantee that further developments are continually in the making."

Mr. Fairless praised the "American way of doing things," and told the cannery that he found business signs encouraging. Present indications are that we are still in the part of the recovery cycle within which the physical volume of business may rise, or at least hold the gains that have been registered, he said.

U. S. Mills Lead

The steel corporation's chief administrative officer declared that the present capacity of continuous mills in the United States is five to six times that of any other country, noted that the steel industry spent more than \$175,000,000 for plant improvements and construction in 1938, and described the canning industry as a "powerful factor for the defense and maintenance of our national well being."

The convention, which found 190 makers of canning machinery and supplies exhibiting many of their products, heard Dr. Neil Carothers, Lehigh University business school dean, advocate a research project to help solve the canning industry's problems, and listened to J. Harry Covington, cannery association counsel, tell how a study might reveal prospects for further market expansion. H. L. Cannon said the association's economic research committee, which he heads, "seeks to bring about more intelligent production and merchandising methods and sounder relations with agri-

culture, related industries, bankers and the Government."

Dingle-Clark Co., Cleveland, contracting engineers headed by W. W. Clark, after Feb. 1 will sell through its Cleveland, Philadelphia and Pittsburgh offices the Waldron gear type flexible couplings made by the John Waldron Corp., New Brunswick, N. J.

McKeesport Tin Plate Wage Scale Adjusted

PITTSBURGH—SWOC and McKeesport Tin Plate Corp. have settled the wage problem recently brought on when the company asked for reductions from 6 to 15 per cent. The base of 62½c. an hour was not changed but adjustments were made in the higher brackets. Actual details were not disclosed by the company or the union.

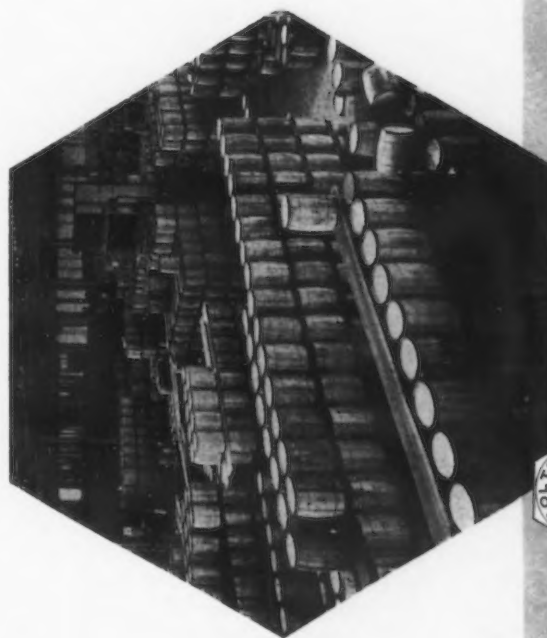
COMPLETE, satisfactory service cannot be developed in a day—or in a few years. It is the result of long experience, continuous, active development and expansion to adequate proportions to satisfactorily meet the needs of every customer.

R B & W, as one of the world's leading and oldest manufacturers of industrial fastenings, stands alone in its ability to provide such service—and actively exercises this ability.

The very size of our operations enables maintenance of largest warehouse stocks, widely distributed to insure prompt delivery. Unwavering integrity in sales policies insures fair, intelligent dealing with our customers. In the three R B & W plants, experienced engineers supervise and continually improve production—from the original selection of raw stocks to our own specification, through the last painstaking inspection to guard against the slightest flaw in finished product.

**RUSSELL, BURDSALL & WARD
BOLT AND NUT COMPANY**
PORT CHESTER, N. Y. ROCK FALLS, ILL. CORAOPOLIS, PA.
SALES OFFICES: CHICAGO • DETROIT • PHILADELPHIA
DENVER • SAN FRANCISCO • LOS ANGELES • SEATTLE • PORTLAND

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BOLTS: Carriage • Machine • Lag • Plow • Stove • Elevator • Step • Tap • Wheel & Rim • Battery • U-Bolts • Tire • Automotive • Drilled • Faced • Special Heat Treated • Etc. • NUTS: Cold Punched • Semi-Finished • Hot Pressed • Case Hardened • Slotted • Castle • Machine Screw • Marlen Lock • Low Sulphur • RIVETS: Standard • Tinners' • Coopers' • Culvert • Clevis and Hinge Pins • SCREWS: Cap • Machine • Hanger • Sheet Metal • Phillips • Recessed • Head • WASHERS: Plate • Burrs • MATERIALS: Steels • Alloys • Non-ferrous Metals • Brass • Bronze • Invar • Etc. • ROLLERS: and others • RODS: Stove • Seat • Ladder • PLATED PARTS: Cadmium • Zinc • Chromium • Nickel • Hot Galvanized • Copper • Tin • SPECIAL UPSET & PUNCHED PRODUCTS.

... PERSONALS ...

F. A. TOBITT has been appointed manager of Eastern sales, J. A. INGWERSEN, manager of Midwestern sales, and G. W. BREIEL, manager of Southern-Western sales, for the American Rolling Mill Co., Middletown, Ohio. Mr. Tobitt joined the company in 1912 and has held various executive sales positions. For the past six years he has been manager of enameling sheet sales. Mr. Ingwersen has been identified with the company for the past 15 years, first in employment service and later in sales work. He became manager of hot and cold rolled sales in 1932. Mr. Breiel joined the Armco sales organization in 1927 and was made manager of galvanized and long terme sales in 1932.



THOMAS DREVER, who has been vice-president of American Steel Foundries, Chicago, since 1932, has been elected president to succeed the late George E. Scott. Mr. Drever joined the company as controller in 1910 and was made secretary and treasurer in 1929. OLIVER E. MOUNT, who has been secretary and assistant treasurer since 1932, has been elected treasurer, continuing as secretary.



E. A. BROWN, JR., has been appointed superintendent of the fuel department at Gary works of Carnegie-Illinois Steel Corp. Mr. Brown succeeds VACLAV GREGOR, who was recently made assistant superintendent of steel production.

Mr. Brown began his service with the corporation in 1911 as a tracer and detailer at its Homestead works where he remained until 1937. During this time he served in the experimental engineering department and as turn foreman, special engineer, and assistant to mechanical engineer in charge of steam and power. In August, 1937, he was transferred to the corporation's Duquesne works as assistant to general superintendent, which position he held until his present appointment.



MURRAY W. SALES, president of Murray W. Sales & Co., Detroit, has been elected to the board of directors of the National Steel Corp., Pittsburgh.



J. F. CHAPPLE has been appointed assistant district sales manager at Houston for Republic Steel Corp. He has spent all of his life in steel sales, starting with the Gulf States Steel Co. in 1918. He was employed in both



F. A. TOBITT



J. A. INGWERSEN

the clerical and selling divisions and remained with the company after its merger with Republic, serving as salesman in the Birmingham territory.



JOHN J. O'BRIEN, president, South Bend Lathe Works, South Bend, Ind., has established a research fellowship in metallurgy at the University of Notre Dame. Mr. O'Brien's gift is in the form of a joint benefaction which will be designated as "The Miles and John J. O'Brien Fellowship in Metallurgy and Allied Sciences."



LOUIS J. GALBREATH, who has headed the product development department of the Revere Copper & Brass, Inc., New York, has been appointed technical adviser for the New York district sales division. He received his engineering degree from Cornell University in 1917 and has been identified with the Revere company since 1935. He was at one time associated with the Mueller Brass Co.



W. D. ENDRES, heretofore divisional manager of the Chicago office of the Billings & Spencer Co., Hartford, Conn., has been appointed sales manager in charge of the merchandise tool division, succeeding W. ROY MOORE, who resigned recently.



C. F. REEVES has been appointed manager of the New York sales branch of Monsanto Chemical Co.'s plastics division. Mr. Reeves has a long record of experience in the plastics industry, having been with Celluloid Corp. from 1904 to 1932, when he

resigned as vice-president and director of sales to join Fiberloid Corp. as sales manager of the sheet plastics division in Springfield, Mass. In April, 1938, Fiberloid Corp. was merged with Monsanto Chemical Co., St. Louis, and is now known as the plastics division. He will make his headquarters in the Monsanto general offices in the R.C.A. Building, New York.

F. A. ABBIATI has been named sales manager of all Monsanto sheet plastics. Mr. Abbitai for the past 12 years has been active in both development and sales work with the Merrimac division of Monsanto in Boston. He will be in charge of sales for Monsanto Vue-Pak transparent packaging material; Monsanto cellulose acetate and cellulose nitrate in sheets, rods, and tubes.

S. A. BELL has been promoted from within the sales organization to assistant sales manager in charge of sheets, rods, and tubes under Mr. Abbiati. The sales of nitrocellulose will be combined with the sales of Monsanto molding compounds and W. W. POWERS will be in charge of nitro-cellulose sales under GEORGE GRESS, sales manager of Monsanto molding compounds. All divisional sales executives are under JOHN H. CLARK, general manager of sales.



ADOLPH FRANKEL has been appointed sales manager of special products of the Westinghouse Lamp Division, Westinghouse Electric & Mfg. Co., with headquarters at the Bloomfield, N. J., plant. He will be responsible for sales of Sterilamps, electronic tubes, X-ray tubes, and all other products of the lamp division



G. W. BREIEL



J. J. O'BRIEN

M. W. O'BRIEN

except lamps. He has been with the company since 1917 and later was transferred to the executive sales department of the company in New York until 1937 when he was made merchandising manager of the lamp division.

♦ ♦ ♦

MICHAEL DWYER, Minister of Public Works and Mines and Minister of Labor in the Nova Scotia Government, has announced his resignation to become president and general manager of the reorganized Nova Scotia Steel & Coal Co.

♦ ♦ ♦

D. C. SWANDER, JR., has been elected secretary of the Columbian Vise & Mfg. Co., Cleveland.

♦ ♦ ♦

A. F. PLANT, district manager, the Austin Co., Detroit, since 1927, and in charge of its operations in that territory since 1922, has been named regional vice-president of the organization, which maintains regional offices at 2842 West Grand Boulevard, Detroit.

♦ ♦ ♦

JOSEPH W. FRAZER has been elected president and general manager of Willys-Overland Motors Inc., Toledo, Ohio, succeeding DAVID WILSON. Formerly he was with the Chrysler Corp.

♦ ♦ ♦

L. P. ROBINSON, sales manager for the Werner G. Smith Co., div. of Archer-Daniels-Midland Co., Cleveland, and chairman of the North-eastern Ohio chapter of the American Foundrymen's Association, was the principal speaker at the Jan. 19 meet-

ing of the Detroit chapter, AFA. He delivered a technical talk on latest developments in core room control. In addition, Mr. Robinson gave a new and humorous slant on the operation of a foundry, speaking on "The Love Life of a Pullet." This subject dealt with the similarity of operating a poultry farm and a foundry from a mechanical standpoint.

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H. M. REINEMAN has resigned as president of the Lafayette Steel Corp., Chicago.

♦ ♦ ♦

R. F. JACKSON has been placed in charge, as manager of mechanical sales, of the Baltimore branch office of the mechanical goods division, of the United States Rubber Co. This office has heretofore functioned under supervision of the Philadelphia branch, but will now operate as an independent branch. FRANK M. URBAN, formerly assistant to W. T. KEENAN, manager mechanical sales, Chicago branch, has been appointed assistant manager, mechanical sales of that branch.

♦ ♦ ♦

LORIN L. FERRALL, heretofore metallurgist for the Timken Roller Bearing Co., Canton, Ohio, has resigned to become identified with the Rotary Electric Steel Co., Detroit.

♦ ♦ ♦

JOHN R. HECKMAN has been made Midwestern representative for the Electro-Alloys Co., Elyria, Ohio. He will make his headquarters at 122 South Michigan Avenue, Chicago.

♦ ♦ ♦

CHARLES W. PEARSON, vice-president and sales manager of the Buffalo

Foundry & Machine Co., Buffalo, has been promoted to executive vice-president and general manager. He entered the employ of the company in 1905 as assistant bookkeeper, and for 33 years has been engaged in executive capacities in various departments.

♦ ♦ ♦

W. H. JOHNSON, formerly purchasing agent of the Climax Engineering Co., Clinton, Iowa, has been appointed purchasing agent of Foote Brothers Gear & Machine Corp., Chicago.

♦ ♦ ♦

H. L. EDSALL, secretary and director of public relations of the G. S. Rogers & Co., Chicago, has resigned.

♦ ♦ ♦

JOHN F. BAKER, formerly with Surface Combustion Co., has been appointed representative in the Pittsburgh district for the Ajax Electric Co., Philadelphia.

♦ ♦ ♦

C. W. HEPPENSTALL, president and treasurer of the Heppenstall Co., Pittsburgh, since 1920, has been made chairman of the board of directors. R. B. HEPPENSTALL, formerly vice-president and general manager of sales, has been elected president, and will be succeeded by S. B. HEPPENSTALL, JR., who has been assistant manager in the sales department. C. W. HEPPENSTALL, JR., formerly general manager, has been made vice-president in charge of operations, and G. F. RITENBAUGH, secretary of the company, also has been made treasurer. The Heppenstall Co. this year will celebrate the 50th anniversary of the business which was founded as the Trethewey Mfg. Co. in 1889.

Weir Denies Published Report Of Weakness In Steel Prices

E. T. WEIR, chairman of National Steel Corp., this week joined other steel executives in a general denial of a published report that price weakness in steel had caused a letdown in buying, Mr. Weir said:

"I know of no weakness in the steel price structure, nor has National Steel Corp., which sells steel products throughout the country, encountered price competition in the form of eliminated 'extras' or other concessions. There has been some easing in the demand for steel which is not unexpected at this time of the year.

"It certainly is not due to any withdrawal of buyers who wish to place steel specifications but are holding back because of some supposed weak-

ness in the price structure. The present decline in buying is not serious and by early March we undoubtedly will find consumer demand upward again. Published prices today are very low as is indicated by the small profits now general in the steel industry.

"Railroad buying is now as low as it has been for the past year and consequently it is not responsible for any considerable volume of steel production. As for current buying practice of allied steel consumers, it is not different now than it has been right along and certainly there is no change in buying that can be attributed to any fear of a weakened price structure."

Other chief executives of independent steel companies made the following statements to THE IRON AGE by telegraph on Tuesday.

"Rumors of this sort usually start at night, as stated in *The Wall Street Journal*. Our impression is that slowing down in steel demand is only seasonal and that price schedules, including established extras for grades and classifications, are being maintained."

"We see no evidence of any general weakness in market for our products."

"We have no knowledge of general weakness in steel price structure, reports of which appeared on financial news tickers on Monday."

REINFORCING STEEL

... Awards of 10,500 tons;
4700 tons in new projects.

NORTH ATLANTIC STATES AWARDS

- 1535 Tons, Queens, N. Y., Bowery Bay sewage disposal plant, to Jones & Laughlin Steel Corp., Pittsburgh.
- 400 Tons, Southbury, Conn., training school and home for feeble-minded, to Bethlehem Steel Co., Bethlehem, Pa.; A. E. Stephens & Co., Springfield, Mass., contractors.
- 375 Tons, Queens, N. Y., Plumb Beach channel bridge, Jamaica, Bay, to Jones & Laughlin Steel Corp., Pittsburgh; through Arundel Corp., Baltimore.
- 325 Tons, Maplewood, N. J., reservoir, to Bethlehem Steel Co., Bethlehem, Pa.; through La Fera-Greco Contracting Co., Newark, N. J., contractor.
- 300 Tons, New York, highway bridge, Moshulu Avenue in Bronx, to Joseph T. Ryerson & Son, Inc., Jersey City.
- 250 Tons, Springfield, Mass., training school, to Concrete Steel Co., Boston; George A. Fuller Co., Boston, contractor.
- 175 Tons, Auburn, N. Y., Technical Junior High School, to Bethlehem Steel Co.; through W. E. Bouley & Co., contractors.
- 150 Tons, Buffalo, storm drain, to Bethlehem Steel Co.; through Lombardo Bros., Inc., Buffalo, contractor.
- 105 Tons, Rocky Hill, Conn., Soldiers' Home, to Concrete Steel Co., Boston; F. H. McGraw & Co., Hartford, Conn., contractors.
- 100 Tons, Washington, Thomas Jefferson Memorial, Rosslyn Steel & Cement Co., Rosslyn, Va., to Bethlehem Steel Co., Bethlehem, Pa.; through Charles H. Tompkins Co., Washington, sub-contractor.

CENTRAL AND WESTERN STATES

- 3240 Tons, Bonneville, Ore., Bonneville project, powerhouse, to Bethlehem Steel Co., Portland; through L. H. Hoffman, Portland, contractor.
- 713 Tons, Mare Island, Cal., quay wall, to Gilmore Fabricators, Inc., San Francisco; through Healy-Tibbets Construction Co., San Francisco, contractor.

- 650 Tons, Los Angeles, May Co. store, to Consolidated Steel Corp., Los Angeles; through Ford J. Twaits Co., Los Angeles, contractor.
- 420 Tons, Seattle, East 45th Street viaduct, to Northwest Steel Rolling Mills, Seattle; through Western Construction Co., Seattle, contractor.
- 415 Tons, Olympia, Wash., Capitol additions, to Seattle Steel Co., Seattle; through MacDonald Building Co., Tacoma, contractor.
- 400 Tons, Frankfort, Ky., State office building, to Truscon Steel Co., Youngstown; through Skilton Construction Co., Louisville, contractor.
- 247 Tons, Berkeley, Cal., university press building, to Gunn-Carle & Co., San Francisco; through Dinwiddie Construction Co., San Francisco, contractor.
- 170 Tons, Blaisdell, Ariz., Gila project (Invitation 24690-A), to Columbia Steel Co., San Francisco.
- 150 Tons, Los Angeles, U.S.C. buildings, to Security Materials Co., Los Angeles; through Robert Millsap, Los Angeles, contractor.
- 136 Tons, Rutledge, Tex., Colorado River project (Invitation 46644), to Republic Steel Corp., Cleveland.
- 108 Tons, Sacramento, Cal., sewage disposal plant, to Gilmore Fabricators, Inc., San Francisco.
- 104 Tons, San Francisco, Lawton School, to Bethlehem Steel Co., San Francisco; through Leo Epp, San Francisco, contractor.

PENDING REINFORCING BAR PROJECTS

ATLANTIC STATES

- 1000 Tons, Havre de Grace, Md., highway bridge; bids on substructure within several weeks.
- 258 Tons, Columbia County, N. Y., mostly mesh, highway project R.C. 2558; Lane Construction Co., Meriden, Conn., low bidder (previously reported).
- 200 Tons, New York, alterations to Pier 26, North River.
- 200 Tons, Cambridge, Mass., high and Latin school additions and alterations.
- 134 Tons, Montgomery County, N. Y., highway project F.A.G.M. 8528; McLain Construction Corp., Buffalo, low bidder (previously reported).

- 104 Tons, Steuben County, N. Y., mostly mesh, highway project R.C. 4014; Hornell Construction Co., Hornell, N. Y., low bidder (previously reported).

CENTRAL AND WESTERN STATES

- 3150 Tons, Chicago, third section of subway.
- 500 Tons, Columbus, rail steel bars for Lazarus Brothers warehouse; Frank Messer, Cincinnati, general contractor (previously reported).
- 110 Tons, Cleveland, Carter Road-West Third Street bridge sub-structure; new bids Feb. 2.
- Unstated tonnage, Youngstown, Ohio, Marshall Street bridge; bids Feb. 2.
- Unstated tonnage, Youngstown, Covington grade school; bids Feb. 10.

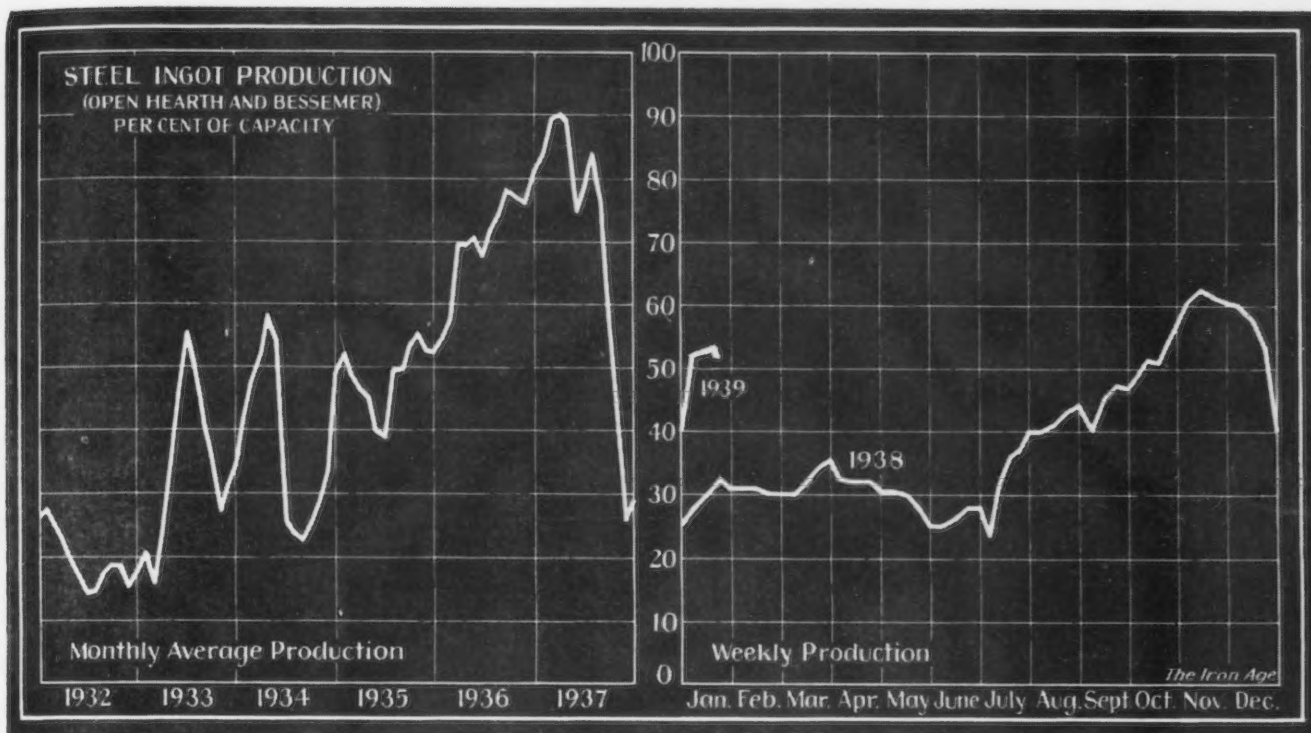
Steel Institute Meeting Is Set for May 25

THE 48th general meeting of the American Iron and Steel Institute will be held at the Waldorf-Astoria, New York, on Thursday, May 25. Attendance at all sessions of the meeting and at the banquet will again be restricted to individual members of the institute.

Ogdensburg Shipbuilding Low on 4000-Ton Ship

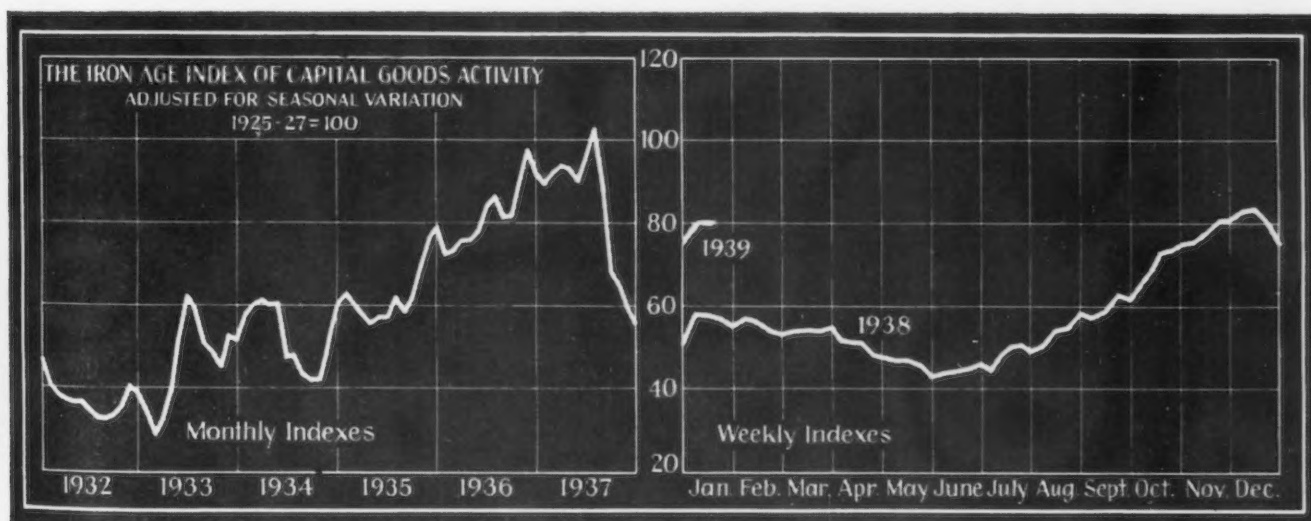
WASHINGTON — Submitting a figure of \$285,000 to the United States Maritime Commission on Tuesday, the Ogdensburg Shipbuilding and Dry Dock Co. was the lowest bidder for the construction of a 4000-ton cargo ship to be built for the Erie and St. Lawrence Corp., New York. The vessel will require about 1500 tons of steel.

Ingot Production Rises 1 Point to 52 Per Cent



District Ingot Production, Per Cent of Capacity		CURRENT WEEK	Pitts- burgh	Chicago	Valleys	Phila- delphia	Cleve- land	Wheel- ing	Buffalo	Detroit	Southern	S. Ohio River	Western	St. Louis	East- ern	Aggre- gate
			PREVIOUS WEEK	46.0	46.0	47.0	35.0	57.0	79.0	45.0	87.5	65.0	60.0	45.0	45.0	60.0
			44.0	49.0	53.0	35.0	48.0	83.0	45.0	87.5	60.5	62.0	40.0	45.0	75.0	53.0

Weakness in Steel Series Eases Index to 80.2



WEAKENED by the failure of steel production to improve as rapidly as is usual at this time of the year, THE IRON AGE index of capital goods activity declined 0.2 point to 80.2 for the week ended Jan. 21. This lag in steel output caused the series to drop to 85.9 for the week as against 92.0 in the preceding week. All the other factors of the index showed small gains for the week, except the Pittsburgh component which remained unchanged.

The heavy construction industry is still the brightest spot on the business horizon at present, for although the past week's awards were not up to the record breaking level of the previous week, they were well above the corre-

sponding week of 1938. Thus far this year construction awards have amounted to \$262,210,000, a gain of 88 per cent over the similar period of 1938.

	Week Ended Jan. 21	Week Ended Jan. 14	Comparable Week	
			1938	1929
Steel ingot production ¹	85.9	92.0	44.0	118.7
Automobile production ²	81.8	79.3	70.0	154.0
Construction contracts ³	104.8	104.2	66.6	122.7
Forest products carloadings ⁴	56.9	55.1	54.3	134.7
Production and shipments, Pittsburgh District ⁵	71.4	71.4	52.3	118.6
Combined index	80.2	80.4	57.4	129.7

Sources: 1. THE IRON AGE; 2. Ward's Automotive Reports; 3. Engineering News-Record; 4. Association of American Railroads; 5. University of Pittsburgh.

... SUMMARY OF THE WEEK ...

... *Mill quotations on steel products are generally firm.*

o o o

... *10,000-ton sheet purchase by motor company at full prices.*

o o o

... *Production slightly lower; large rail orders placed.*

FAILURE of steel business generally to attain the pace this month that the more optimistic had expected may be due to several circumstances, chief among which is the caution of private enterprise in the face of continued uncertainties at home and abroad. In the domestic scene close watch is being kept on the new Congress, which has not yet had full opportunity to demonstrate its asserted independence on certain New Deal policies that have been regarded as discouraging to business.

The steel price situation seems to be having little or no bearing on current steel purchases despite published reports to the contrary. Careful investigation by THE IRON AGE discloses no new elements of price weakness, but instead a firming up of quotations that were weak during much of last year. The purchase of about 10,000 tons of sheets by an automobile manufacturer is said to have brought no concessions. (See steel price story on page 72.)

Most of the price weakness in steel products is in secondary markets, such as fabricators of structural steel, distributors of reinforcing bars and jobbers of merchant pipe, wire nails, galvanized formed roofing and bolts and nuts, but these are situations that are a hangover from last year and appear to be in process of correction; possibly they will not entirely disappear until stocks acquired at prices below those now quoted have been liquidated. Mill prices on virtually all products are firmer than they have been at any time within the past year.

INGOT production has declined one point to 52 per cent for the industry as a whole, but the situation is made up of contradictions, gains occurring in some districts and losses elsewhere. For example, the Pittsburgh district is up two points to 46 per cent, while the Chicago district has declined three points to the same figure. The Cleveland-Lorain area has gained nine points to 57 per cent, but other Ohio districts have lower operations, Youngstown being off five points to 47 per

cent and Southern Ohio is two points lower at 60 per cent. The Wheeling-Weirton district is also operating at a lower rate, but the South has gained nearly five points to 65 per cent. In most of the smaller districts operations are fairly steady. Some of the losses may be accounted for by the completion of rollings of low-priced sheet and strip tonnage booked last October.

ALTHOUGH steel business is not coming up to earlier expectations for this month, there has been a slow, consistent gain since the first week of the year, it being estimated by some companies that their aggregate tonnage this month may run as much as 20 per cent ahead of that received in December.

Railroad buying is bringing out the largest tonnages, the automobile industry being content to order relatively small fill-in lots as it carefully watches retail sales as a guide to assembly schedules next month.

The outstanding railroad purchase was 100,000 tons of rails and accessories by the Union Pacific, Carnegie-Illinois and Colorado Fuel & Iron, each receiving 32,657 tons of rails and Inland Steel 8906 tons. Nearly 26,000 tons of accessories were divided among a number of producers. Other rail orders were 25,000 tons for the Southern, placed with the Tennessee mill; 12,800 tons for the Seaboard Air Line, divided between two mills, and 6000 tons for the Soo Line. This week's orders bring total rail orders for 1939 rolling to about 300,000 tons.

Tin plate production has gained slowly to about 45 per cent, but can makers, who are meeting with the canners this week in Chicago, are expected to issue heavier releases next month.

Fabricated structural steel awards are at a slower pace since the first of the year, but totaled nearly 22,000 tons for the week, mostly in public projects, while reinforcing bar lettings were 10,500 tons. New structural steel jobs in the market total about 28,500 tons, headed by 12,000 tons for a bridge at Havre de Grace, Md.

Pig iron shipments are gaining sharply this month at Chicago and Cleveland. A Cleveland producer expects the best month since November, 1937.

Large purchases of steel scrap by a leading steel company have strengthened markets at Pittsburgh, Youngstown, Cleveland and Buffalo, but there has been no change in THE IRON AGE composite price, which remains at \$15.

A new use for strip steel by the automobile industry lies in the possible widespread adoption of leaf springs for coil springs in upholstered interiors.

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A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Jan. 24, 1939	Jan. 17, 1939	Dec. 27, 1938	Jan. 25, *1938
Rails, heavy, at mill.....	\$40.00	\$40.00	\$40.00	\$42.50
Light rails: Pittsburgh, Chicago, Birmingham	40.00	40.00	40.00	43.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point.....	34.00	34.00	34.00	37.00
Sheet bars: Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point	34.00	34.00	34.00	37.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham	40.00	40.00	40.00	43.00
Wire rods: Nos. 4 and 5, Pittsburgh, Chicago, Cleveland	43.00	43.00	43.00	47.00
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows Point, cents per lb.	1.90	1.90	1.90	2.10

Finished Steel

Cents Per Lb.:	Jan. 24, 1939	Jan. 17, 1939	Dec. 27, 1938	Jan. 25, *1938
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.25	2.25	2.25	2.45
Plates: Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont	2.10	2.10	2.10	2.25
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham	2.10	2.10	2.10	2.25
Cold finished bars: Pittsburgh, Buffalo, Cleveland, Chicago, Gary	2.70	2.70	2.70	2.90
Alloy bars: Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton	2.80	2.80	2.80	3.00
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham	2.15	2.15	2.15	2.40
Cold rolled strip: Pittsburgh, Cleveland, Youngstown	2.95	2.95	2.95	3.20
Sheets, galv., No. 24: Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham	3.50	3.50	3.50	3.80
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown	2.15	2.15	2.15	...
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown	3.20	3.20	3.20	...

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Cents Per Lb.:

	Jan. 24, 1939	Jan. 17, 1939	Dec. 27, 1938	Jan. 25, *1938
Wire nails: Pittsburgh, Chicago, Cleveland, Birmingham	2.45	2.45	2.45	2.75
Plain wire: Pittsburgh, Chicago, Cleveland, Birmingham	2.60	2.60	2.60	2.90
Barbed wire, galv.: Pittsburgh, Chicago, Cleveland, Birmingham	3.20	3.20	3.20	3.40
Tin plate, 100 lb. base box: Pittsburgh and Gary	\$5.00	\$5.00	\$5.00	†\$5.35

*Pittsburgh prices only.
† Subject to post-season adjustment.

Pig Iron

Per Gross Ton:	Jan. 24, 1939	Jan. 17, 1939	Dec. 27, 1938	Jan. 25, *1938
No. 2 fdy., Philadelphia	\$22.84	\$22.84	\$22.84	\$25.84
No. 2, Valley furnace	21.00	21.00	21.00	24.00
No. 2, Southern Cin'ti	21.06	21.06	21.06	23.89
No. 2, Birmingham	17.38	17.38	17.38	20.38
No. 2, foundry, Chicago†	21.00	21.00	21.00	24.00
Basic, del'd eastern Pa.	22.34	22.34	22.34	25.34
Basic, Valley furnace	20.50	20.50	20.50	23.50
Malleable, Chicago†	21.00	21.00	21.00	24.00
Malleable, Valley	21.00	21.00	21.00	24.00
L. S. charcoal, Chicago	28.34	28.34	28.34	30.24
Ferromanganese, seab'd carlots	80.00	80.00	92.50	102.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:	Jan. 24, 1939	Jan. 17, 1939	Dec. 27, 1938	Jan. 25, *1938
Heavy melting steel, P'gh...\$15.75	\$15.75	\$15.75	\$15.75	\$14.25
Heavy melting steel, Phila... 15.25	15.25	15.25	15.25	14.75
Heavy melting steel, Ch'go.. 14.00	14.00	13.75	13.75	13.00
Carwheels, Chicago	12.50	12.50	12.50	15.50
Carwheels, Philadelphia	16.75	16.75	16.75	16.25
No. 1 cast, Pittsburgh	15.50	15.50	15.50	16.25
No. 1 cast, Philadelphia	16.75	16.75	16.75	16.75
No. 1 cast, Ch'go (net ton).. 12.75	12.50	12.50	12.50	12.50

Coke, Connellsville

Per Net Ton at Oven:	Jan. 24, 1939	Jan. 17, 1939	Dec. 27, 1938	Jan. 25, *1938
Furnace coke, prompt	\$3.75	\$3.75	\$3.75	\$4.00
Foundry coke, prompt	4.75	4.75	4.75	5.00

Non-Ferrous Metals

Cents per Lb. to Large Buyers:	Jan. 24, 1939	Jan. 17, 1939	Dec. 27, 1938	Jan. 25, *1938
Copper, electrolytic, Conn. . .	11.25	11.25	11.25	10.25
Copper, Lake, New York	11.375	11.375	11.375	10.625
Tin (Straits), New York	46.25	46.50	46.50	41.00
Zinc, East St. Louis	4.50	4.50	4.50	5.00
Zinc, New York	4.89	4.89	4.89	5.35
Lead, St. Louis	4.60	4.70	4.70	4.75
Lead, New York	4.75	4.85	4.85	4.90
Antimony (Asiatic), N. Y... 14.00	14.00	14.00	14.00	15.625

The Iron Age Composite Prices

Finished Steel

	2.286 a Lb.	2.286	2.286	2.512c.
January 24, 1939	2.286 a Lb.	2.286	2.286	2.512c.
One week ago	2.286	2.286	2.286	2.512c.
One month ago	2.286	2.286	2.286	2.512c.
One year ago	2.286	2.286	2.286	2.512c.
1938.....	2.512c., May 17; 2.211c., Oct. 18			
1937.....	2.512c., Mar. 9; 2.249c., Jan. 4			
1936.....	2.249c., Dec. 28; 2.016c., Mar. 10			
1935.....	2.062c., Oct. 1; 2.056c., Jan. 8			
1934.....	2.118c., Apr. 24; 1.945c., Jan. 2			
1933.....	1.953c., Oct. 3; 1.792c., May 2			
1932.....	1.915c., Sept. 6; 1.870c., Mar. 15			
1931.....	1.981c., Jan. 13; 1.883c., Dec. 29			
1930.....	2.192c., Jan. 7; 1.962c., Dec. 9			
1929.....	2.223c., Apr. 2; 2.192c., Oct. 29			
1928.....	2.192c., Dec. 11; 2.142c., July 10			
1927.....	2.402c., Jan. 4; 2.212c., Nov. 1			

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 35 per cent of the United States output.

Pig Iron

	\$20.61 a Gross Ton	20.61	20.61	23.25
January 24, 1939	\$20.61 a Gross Ton	20.61	20.61	23.25
One week ago	20.61	20.61	20.61	23.25
One month ago	20.61	20.61	20.61	23.25
One year ago	20.61	20.61	20.61	23.25
1938.....	23.25, June 21; 19.61, July 6			
1937.....	23.25, Mar. 9; 20.25, Feb. 16			
1936.....	19.73, Nov. 24; 18.73, Aug. 11			
1935.....	18.84, Nov. 5; 17.83, May 14			
1934.....	17.90, May 1; 16.90, Jan. 27			
1933.....	16.90, Dec. 5; 13.56, Jan. 3			
1932.....	14.81, Jan. 5; 13.56, Dec. 6			
1931.....	15.90, Jan. 6; 14.79, Dec. 15			
1930.....	18.21, Jan. 7; 15.90, Dec. 16			
1929.....	18.71, May 14; 18.21, Dec. 17			
1928.....	18.59, Nov. 27; 17.04, July 24			
1927.....	19.71, Jan. 4; 17.54, Nov. 1			

Based on average basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Steel Scrap

	\$15.00 a Gross Ton	15.00	14.92	14.00
January 24, 1939	\$15.00 a Gross Ton	15.00	14.92	14.00
One week ago	15.00	15.00	14.92	14.00
One month ago	15.00	15.00	14.92	14.00
One year ago	15.00	15.00	14.92	14.00
1938.....	15.00, Nov. 22; 11.00, June 7			
1937.....	21.92, Mar. 30; 12.92, Nov. 16			
1936.....	17.75, Dec. 21; 12.67, June 9			
1935.....	13.42, Dec. 10; 10.33, Apr. 23			
1934.....	13.00, Mar. 13; 9.50, Sept. 25			
1933.....	12.25, Aug. 8; 6.75, Jan. 3			
1932.....	8.50, Jan. 12; 6.43, July 5			
1931.....	11.33, Jan. 6; 8.50, Dec. 29			
1930.....	15.00, Feb. 18; 11.25, Dec. 9			
1929.....	17.58, Jan. 29; 14.08, Dec. 3			
1928.....	16.50, Dec. 31; 13.08, July 2			
1927.....	15.25, Jan. 17; 13.08, Nov. 22			

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

.. THIS WEEK'S MARKET NEWS ..

STEEL OPERATIONS

... Ingot output for country off one point to 52%

INGOT output has receded in some districts and gained in others, the net result, as calculated by THE IRON AGE, being a one point drop for the industry as a whole to 52 per cent of capacity.

PITTSBURGH has gained two points to 46 points, while CHICAGO has dropped three points to 46 per cent. In the CHICAGO district, however, there were gains at two plants, which were not sufficient to offset losses at two other mills. The WHEELING-WEIRTON district also declined to 79 per cent, a loss of four points, this being due to lower bessemer steel production. At YOUNGSTOWN and vicinity there was a loss of five points to 47 per cent, but in the adjacent CLEVELAND-LORAIN area the resumption of a bessemer converter brought the rate up nine points to 57 per cent. Further slackening of steel operations has occurred in SOUTHERN OHIO, where the rate is off two points to 60 per cent.

DETROIT is doing fairly well at 87½ per cent, the BIRMINGHAM district has gained nearly five points to 65 per cent, while in other districts operations remain fairly steady.

A blast furnace in the PITTSBURGH district and one in the CLEVELAND district resumed production.

NEW BUSINESS

... Volume is below expectations but is slowly gaining

ALTHOUGH the volume of new business continues below what had generally been expected, total orders so far this month are ahead of the comparable December period.

Opinion at PITTSBURGH is that the picture has been clouded some, not necessarily by the failure of business to expand, but because of the uncertain outlook from a financial standpoint. Meanwhile, there are definite indications that in plate requirements, general miscellaneous demand, and to some extent railroad purchases, are on the upgrade. On the other hand, the

largest share of PWA projects has been placed and mills will start to eat into the backlog of structural business.

There's ample evidence also that a cautious hand-to-mouth buying policy is to prevail until regular spring or seasonal factors take hold. There is no indication that the current level of new business will decline, although actual steel output may recede slightly due to mills having worked off backlogs of flat rolled tonnage.

With the exception of the 100,000 tons of rails and accessories ordered by the Union Pacific, railroad buying in the CHICAGO area is quiet. The Union Pacific's inquiry for 1000 to 2000 box cars still is pending.

A pickup in farm equipment activity has lately been responsible for better releases of sheets, bars and shapes to that industry. One CHICAGO mill's improved production this week is caused mostly by demand from a large maker of motor trucks and partially by releases for tractors and tillage tools.

Pig iron shipments are in the spotlight at CLEVELAND. Contrasted to deliveries of steel, which this month are running behind those of December, pig iron shipments will exceed the December total and in the case of one company apparently will be the heaviest since November, 1937. Coke deliveries, another indicator of the foundry melt, are running ahead of November and approximately 20 per cent above the corresponding period of December.

In finished steel, the trend is not strong either way at CLEVELAND and YOUNGSTOWN, but no ground is being lost. Orders are improved in comparison to December, particularly in tin plate, pipe and merchant bars and are in good numerical volume. Diversified buying from miscellaneous consumers, who come in for a carload up to 200 tons at a time, helps to sustain the market until larger purchasers become more active.

At ST. LOUIS the volume of new business developed noticeable expansion during the past week, representing largely orders held in abeyance until stock taking had been completed.

In the NEW YORK market, some mills have experienced gradually increasing volume since the first week of the new year.

PRICES

... Reports of general weakness are not substantiated

ASIDE from "irregularities" in concrete bars and formed galvanizing roofing prices, steel quotations remain relatively firm. As pointed out before, there continues to be some looseness in application of quantity differentials to the extent that the requirement of shipments at one time to one destination is not always strictly adhered to. Nevertheless, despite rumors to the contrary, actual realized prices on steel generally are higher now than for some time. Recent purchases by a large auto maker at the full market price have been considered a fair test of present quotations which, incidentally, are \$6 higher than those in effect last October.

When rumors of concessions are investigated they generally prove to be groundless or due to confusion over extras or the carryover of low-priced tonnage from last year. Pipe out of stock prices have been reaffirmed and attempts made to strengthen them, along with line pipe, nipple pipe and restriction of l. c. l. orders. Irregularities are reported to be scarcer on wire rods.

Resale merchant products remain spotty along with reinforcing bars, as has been the case for more than a year, but strenuous efforts are under way to firm up both classifications.

It is also said that there is not as much complaint of overgrading by mills as there was six months ago. The published statement that "concessions" had caused customers to stay out of the market is considered ridiculous by steel sellers.

IRON ORE

... 1938 consumption of Lake Superior ore 25,703,050 tons

CONSUMPTION of Lake Superior iron ore by furnaces during 1938 totaled 25,703,050 gross tons, less than half of the 1937 figure of 53,996,076 tons, according to the Lake Superior Iron Ore Association.

Ore used during December amounted to 3,040,700 tons, compared with 3,700,000 tons in November.

150,073 tons in November and 1,916,588 tons in December, 1937.

As of Jan. 1, 1939, there was 34,578,849 tons of ore on hand at furnaces and Lake Erie docks, compared with 37,456,325 tons on Dec. 1, 1938, and 40,774,838 tons of Jan. 1, 1938.

Number of furnaces in blast depending principally on Lake Superior iron ores was reduced by five during December to 90 out of 188 available, as compared with 74 in blast out of 190 furnaces available on the last day of 1937.

PIG IRON

... New business light but shipments are gaining in some districts

WHILE new buying of pig iron is extremely light in all areas, shipments are gaining in some districts, particularly those served by furnaces from CHICAGO to CLEVELAND.

Shipments by CLEVELAND producers this month will exceed those of December and, in the case of one company, probably will be the heaviest since November, 1937. Foundry coke shipments in that area for the first 19 days of January had run ahead of the like period in November and were 20 per cent ahead of those for the first 19 days of December.

Agricultural implements and tractor foundries are among the most active consumers as reflected by shipments from both CLEVELAND and CHICAGO. In the first 22 days of January pig iron shipments by CHICAGO furnaces were up about 14 per cent over those of December, while foundry coke shipments had gained about 15 per cent. Pig iron sellers expect these percentages to increase by the end of the month.

Shipments and the melt of pig iron have also gained moderately in the St. Louis area and are now at a rate equal to the best recorded in December. Operations at stove foundries in the St. Louis district are being resumed at a high rate.

NEW ENGLAND also has had a small gain in foundry operations and foundrymen have become more optimistic as to business prospects this year.

There seems to have been little or no improvement in the PITTSBURGH, PHILADELPHIA and NEW YORK territories.

Another blast furnace has been blown in at the Edgar Thompson works of Carnegie-Illinois Steel Corp., bringing the number in blast there to three.

Market Sidelights

INABILITY of English mills to make immediate delivery has thrown some business to United States producers recently. One order of this type involved oil refinery business for Holland.

* * *

Operations at the axle plant of Eaton Mfg. Co., Cleveland, are heaviest of any January since 1929. Two-speed axles for trucks are reported in increased demand.

* * *

Operations were resumed last week at the Bessemer, Ala., plant of the Pullman-Standard Car Mfg. Co. The plant will work on the order of 1300 freight cars for the Southern Railway.

* * *

Work is expected to start about March 1 on a new \$4,500,000 low rent housing project in Birmingham.

SEMI-FINISHED STEEL

... Gain in tin bar requirements expected

A MODERATE decline in specifications occurred last week at PITTSBURGH but current tonnages compare favorably with recent averages. A gain in tin bar demand is anticipated next month when non-integrated tin plate makers step up operations because of seasonal requirements.

PLATES

... Some improvement in near future is sighted

ALTHOUGH activity in plates has been at low ebb for some time, work that is in the making promises an improvement within the near future. Railroad car and locomotive building and repair work is one of the best prospects and already has resulted in some orders.

The largest pending inquiry calling for use of plates in the CHICAGO market, for example, is that of the Union Pacific for 1000 to 2000 box cars. The Southern Pacific's expected order for 40 locomotives, on which prices are now being compiled, probably will go largely to an Eastern builder. Demand from car builders has greatly assisted one plate mill in the CLEVELAND district.

Recent Government awards under the Walsh-Healey Act have aided

some of the EASTERN plate mills. The Alan Wood Steel Co. will furnish about 1200 tons of high-tensile plates, Worth Steel Co. will furnish about 1000 tons of plates and 10,000 tons of plates, shapes and bars will be furnished by Bethlehem, Midvale, Enterprise Galvanizing Co. and John Wood Mfg. Co. Deliveries on these orders will be spread over some months.

At St. Louis it is expected that recent approval of railroad budgets will bring out some plate buying by the middle of February. Barge builders, who bought fairly large tonnages in 1938, are expected to increase their requirements this year as construction of river barges planned for the first half of this year will call for the use of several thousand tons of plates.

Several thousand tons have been awarded for the Delaware aqueduct that is being built to serve New York City, about 5000 tons for a concrete aqueduct to serve Boston with water has been placed, and 900 tons will be used in a water pipe line for Corvallis, Ore., the pipe line having been awarded to the Beall Pipe & Tank Co., Portland. A fairly substantial tonnage will result from the construction of three large oil-fueled steam generating plants by the Pacific Gas & Electric Co., San Francisco.

STRUCTURAL STEEL

... Piscataqua River bridge involving 5150 tons, goes to Phoenix Bridge

AWARDS were light this week and new projects were negligible except for 6000 tons of supports needed under Contract No. 313 for the Delaware aqueduct. Awards in the NEW YORK area, totaling 1000 tons, were the smallest in some time. A contract for 5150 tons for the Maine-New Hampshire Piscataqua River bridge went to Phoenix Bridge Co., Phoenixville, Pa.

Structural specifications are holding at Pittsburgh where Carnegie-Illinois Steel Corp. has booked 1500 tons of sheet steel piling for a bulkhead at Providence, R. I. Numerous projects ranging from 200 to 1000 tons are pending in the CHICAGO area with the largest awards of 1450 tons for a music hall at Purdue University and 1910 tons for a stock pavilion at Indianapolis going to American Bridge Co.

Bethlehem Steel Co. will supply bars for the Willert Park housing project in Buffalo. St. Louis reports

few new projects with the outlook good for public works, mainly bridges, in considerable volume, before spring. The biggest award of the week on the WEST COAST was 1300 tons for Bonneville project towers going to Lehigh Steel Construction Co. The Friant dam, Bureau of Reclamation project in California, expected to require 10,000 tons of steel for gate and pipe classifications and several times that amount for the dam itself, is likely to be up for bids before summer.

In the PHILADELPHIA district the volume of public works is showing a little more promise. In prospect are 500 tons for a new structure over the C & D canal to replace the bridge recently wrecked by a boat and perhaps as much as 12,000 tons of shapes for a Maryland highway bridge at Havre de Grace, on which substructure bids may be taken within several weeks.

RAILROAD BUYING

... Union Pacific orders 100,000 ton of rails and fittings ... Other rail orders placed

THE Union Pacific has ordered about 100,000 tons of rails and accessories. The Carnegie-Illinois Steel Corp. and the Colorado Fuel & Iron Corp. each received 32,657 tons of rails and 1600 tons of joint bars, while Inland Steel Co. was awarded 8906 tons of rails and 430 tons of joint bars. The 22,150 tons of accessories remaining were divided among a number of suppliers. The Southern Railway has placed an order with the Tennessee Coal, Iron & Railroad Co. for 25,000 tons of rails and the necessary accessories; the Seaboard Air Line has ordered 7700 tons of rails from the Tennessee company and 5100 tons from Bethlehem Steel Co.; the Soo Line has ordered 6000 tons of rails, of which 3800 tons will be furnished by Carnegie-Illinois and the remainder divided between Bethlehem and Inland.

One of the largest motive power inquiries to come into the market in some time is the Southern Pacific's request for bids on 40 locomotives, of which 28 are to be of the 4-8-8-2 type and 12 of the 2-8-8-4 type.

Other equipment inquiries include 100 refrigerator cars for John Morrell & Co., Ottumwa, Iowa, and five dining cars for the Pennsylvania. The Seaboard Air Line has been authorized to borrow \$640,000 from the Reconstruc-

tion Finance Corp. for the financing of \$725,000 in new equipment. The road will buy a streamlined passenger train consisting of a 2000 hp. diesel locomotive, one baggage-dormitory car, one dining car, one observation coach, one tavern coach and three coaches. The Canadian National will air condition 76 passenger cars in its own shops.

Mack Trucks, Inc., has received an order for 50 buses for the W. F. Transportation Co. of New York for use in an express service to the New York World's Fair.

SHEETS AND STRIP

... Automobile buying is of fill-in character

AUTOMOBILE companies' orders for sheets and strip are mostly of the fill-in variety as the industry watches retail sales carefully in an effort to gage future assemblies of cars. Until there is an upturn in automobile sales, orders for steel may not gain much. No large buying is expected until some time in February.

Otherwise, the demand for sheets and strip is of a spotty character. There has been little or no change in the aggregate quantity of orders being received by PITTSBURGH, CLEVELAND and YOUNGSTOWN mills, but CHICAGO producers note a slight let-down. A few automobile parts makers have cut down their schedules to four days a week pending heavier releases from the automobile companies, which are expected in February. Much of the current business at CHICAGO is coming from manufacturers of refrigerators, stoves, washing machines, farm implements and tractors.

In the NEW YORK district the sheet volume has been progressively better since the first of the month.

REINFORCING BARS

... 3240-ton Bonneville award given to Bethlehem Steel

CONTRACTING in most areas slowed down this week. Bethlehem Steel Co. took a 3240-ton contract for a Bonneville project powerhouse while the Bowery Bay sewage plant project in NEW YORK, involving 1535 tons, went to Jones & Laughlin Steel Corp. The Bonneville job was the biggest reinforcing steel award in the Pacific Northwest this year.

Concrete bar specifications are re-

ported heavier in January to date at PITTSBURGH than in the like period of December and producers look for a continuation of the present volume of business for the next month or so. Interest is centered on an additional section of the Chicago subway, taking 3150 tons. A considerable number of small jobs are reported on the books in the CHICAGO area with cold weather a retarding factor in this and some other districts. Pending work in the NEW YORK area includes a fair-sized tonnage of mesh for various road projects. Four hundred tons for a Southbury, Conn., training school went to Bethlehem Steel.

Rumors persist on the WEST COAST that construction of the Lake Washington pontoon bridge at Seattle may be blocked by the recently convened legislature. The project will require 13,000 tons of reinforcing bars. Inactivity is reported at PHILADELPHIA, where the most promising lot of steel is 750 tons that may go into the Havre de Grace bridge.

COLD FINISHED BARS

... Orders improving but are not satisfactory

NEW business so far this year is slightly better than the same period in December but aggregate orders are far from satisfactory. Some automotive specifications have appeared recently but the majority are of the fill-in variety. Household appliance and jobber buying continues on a strictly hand-to-mouth basis.

WIRE PRODUCTS

... Some improvement in demand seen at Pittsburgh

MERCHANT wire demand at PITTSBURGH has increased slightly and may be the beginning of the spring movement. The improvement in wire nail and barbed wire business has been only moderate but sales of fencing have shown a relatively strong upward trend. Manufacturers' wire demand continues to expand slowly.

Irregularities are scarcer on rod prices to bolt and nut producers, it is reported at CLEVELAND. Resale merchant products remain spotty occasionally in various areas of the nation, but manufacturers' wire is described as firm except for the quantity

allowance. Following heavy orders and shipments in early January, activity at CLEVELAND has contracted in recent weeks.

One CHICAGO mill stepped up operations this week because of increased orders for merchant wire products, this spurt being a forerunner of the usual spring demand.

HOT ROLLED BARS

... Sales gaining slowly and are below expectations

TOTAL hot rolled bar sales at PITTSBURGH so far this month are slightly ahead of the same period in December. Current business, however, is somewhat below expectations but there is evidence that miscellaneous demand is expanding. Producers are looking for additional support from automobile makers some time in February.

Tonnage entered by CLEVELAND and YOUNGSTOWN producers so far this month is improved in comparison to December. Further pick-up is expected next month.

TIN PLATE

... Higher operating rates expected in February ... Now 45%

PRODUCERS expect a substantial improvement in specifications following the canners' convention at CHICAGO this week. Aggregate business so far this year has been below expectations, possibly for several reasons: First, it is customary to increase tonnages after the annual convention; second, seasonal factors do not begin to operate until about the middle of February; third, can makers, like other business, have exercised extreme caution recently in buying habits; fourth, inventory data have not been completely digested;

and fifth, a fairly heavy carry-over in canned goods from last year has acted as a partial brake in new tin plate buying. Notwithstanding these factors, producers look for heavier operations in February and March. There are already definite indications that general line can demand is beginning to expand. While individual orders are not large, the number of buyers who have been absent from the market for some time is increasing. Operations this week may be estimated at 45 per cent of capacity.

TUBULAR GOODS

... Efforts being made to stiffen line pipe quotations

OIL-COUNTRY goods specifications at PITTSBURGH continue to lag but jobber sales of standard mill pipe have been on the up-grade recently. A moderate increase in boiler tubes because of railroad and miscellaneous support has made its appearance.

Principal interest at CLEVELAND and YOUNGSTOWN centers on attempts to firm up prices, particularly line pipe quotations. Pipe out of stock prices have been reaffirmed and jobbers advised only the California and metropolitan New York territories are quoted resale less 10 per cent. Efforts to strengthen nipple pipe prices and to hold L.C.I. shipments to a minimum have been taken. National Tube Co. has been awarded 230 tons of 12 $\frac{3}{4}$ -in. steel pipe and 60 tons of 18-in. steel pipe, with necessary fittings by the city of Lorain, Ohio.

Imports at Philadelphia

PHILADELPHIA—The following iron and steel imports were received here during the past week: 222 tons of pig iron and 131 tons of ferromanganese from the Netherlands and 100 tons of ferromanganese from Czechoslovakia.

Pittsburgh Workmen Fight Way Through CIO Dues Collectors

PITTSBURGH—About 50 dues-delinquent members of the SWOC crashed through dues pickets early this week at the gates of the Hubbard Co., shovel manufacturing plant. Non-union members were able to enter the plant without being molested by the pickets. Once all the employees were in, a local lodge union official instructed union members to stop work and a modified sitdown strike lasting for over three hours but involving only about one-fourth of the employees, occurred. The stoppage of work, generally considered a violation of the union contract between the company and the union, was ended when national officers of the SWOC appeared.

Second FTC Steel Questionnaire Mailed

WASHINGTON—Requesting figures on the distribution of 24 products in 1936, 1937 and 1938, the second Department of Justice Federal Trade Commission questionnaire was sent to about 45 steel companies on Tuesday. Because some of the products are grouped under a single heading, there are 18 columns provided for listing shipments by consuming districts. The form is prepared to accord with records kept by steel manufacturers in order to simplify as far as possible the work of preparing the data. Information is asked for on distribution of the following products—blooms, billets and slabs, sheet and tin plate bars, skelp, wire rods, steel sheet piling, heavy rails, plates, heavy structural shapes, merchant bars, concrete reinforcing bars, hot rolled, cold rolled, hot-rolled annealed, and galvanized sheets, hot and cold-rolled strips, butt-weld, lap-weld and seamless pipe and tubes, tin plate and plain drawn wire.

Weekly Bookings of Construction Steel

	Week Ended				Year to Date	
	Jan. 24, 1939	Jan. 17, 1939	Dec. 27, 1938	Jan. 25, 1939	1939	1938
Fabricated structural steel awards	21,800	22,400	40,800	12,550	99,900	50,800
Fabricated plate awards	2,175	3,970	5,100	360	13,520	5,240
Steel sheet piling awards	2, 75	1,320	200	1,815	3,710	1,815
Reinforcing bar awards	10,500	19,755	5,250	845	41,905	16,560
Total Letting of Construction Steel...	36,650	47,445	51,350	15,570	159,035	74,415

... CANADA ...

... Outlook improving as small lot buying gains

TORONTO, Jan. 24.—A sharp gain in small lot buying has featured business in the Canadian iron and steel markets during the past two weeks. Sales are widely diversified but principal call has been for sheets and bars. Builders' hardware has shown an upturn while at the same time there is a better demand for bolts, nuts, screws, etc. Demand for machinery and machine tools also is active due to the fact that a number of companies are improving plant equipment in preparation for increased production of special lines for airplane production. Mills are maintaining high operating schedules and are well supplied with backlogs which are being augmented daily by small spot business.

The Steel Co. of Canada has blown out one of its blast furnaces for relining, leaving only one active stack in this area. The company is amply supplied with iron for all customers' demands. The blowing out of this stack reduced the total number for Canada to four, but it is understood a stack may blow in by the Dominion Steel & Coal Corp. soon.

The scrap market is showing improvement and dealers look for a sharp upswing in business from the United States in the spring.

... PIPE LINES ...

American Liberty Pipeline Co., First National Bank Building, Dallas, Tex., an interest of American Liberty Oil Co., same address, has authorized new 4-in. welded steel pipe line from pumping station at Wiley, in extension of Rodessa oil field area, Cass County, Tex., to connection with Simpson pumping station, about 2½ miles distant, for crude oil transmission for parent company. From Simpson station transmission to Longview, Tex., will be carried out in pipe line of United Gas Corp.

Louisiana-Nevada Transit Co., Cotton Valley (Webster Parish), La., plans 8½-in. welded steel pipe line from local gas properties to Okay, Howard County, Ark., about 75 miles, for natural gas transmission to mill of Arkansas Portland Cement Co., subsidiary of Ideal Cement Co., at latter place. Cost about \$356,000 with booster stations and other operating facilities. A control station will be built at terminus at cement mill. Natural gas will be secured from properties of A. G. Oliphant Oil Co., Cotton Valley, which has made contract for supply with Arkansas Cement Company. Application for permission to construct and operate line has been made to Federal Power Commission.

United States Engineer Office, Navy Building, Washington, closes bids Jan. 31 for construction of collecting mains at McMillan filtered water reservoir, Washington, consisting of about 1150 ft. of 36 and 48-in., o.d., steel pipe (Circular 50).

Water Commission, Corvallis, Ore., has let contract to Empire Construction Co., 234 N.E. Twenty-eighth Avenue, Portland, for furnishing and constructing main feeder water line

from Rock Creek to reservoir at Baldy Butte, consisting of 42,000 ft. of 20 and 16-in. steel pipe, equally divided between two sizes, at \$119,052 (Schedule B).

Standard Oil Co. of Louisiana, St. Charles Avenue, New Orleans, has authorized installation of 2-in. steel pipe line gathering system in Cotton Valley oil field area, Webster Parish, La., to connect 32 gas-distillate wells in that district.

Texas-New Mexico Pipe Line Co., Houston, Tex., affiliated with Texas Co., same place, Tide Water Associated Oil Co., Tulsa, Okla., and other oil interests, has approved plans for steel pipe line gathering system in Kermit oil field area, Winkler County, Tex., totaling about 10 miles, with pumping stations and operating facilities to handle 2500-bbl. of crude oil per day. Also will build similar pipe line gathering system in Church and Fields oil districts in Crane County, Tex., to handle daily output of about 1400-bbl. of crude oil.

Fallbrook Public Utility District, Fallbrook, Cal., has received following low bids on 50,000 ft. of 12-in. pipe and 2000 ft. of 8-in. pipe: Spiral weld, American Pipe & Steel Corp., Alhambra, Cal.; lap weld, Williams & Van Valkenburg, Los Angeles.

National Tube Co. has been awarded a water line at Lorain, Ohio, requiring 230 tons of 12½-in. steel pipe and 60 tons of 18-in. steel pipe with fittings, and 170 tons at Darien, Conn., for a 24-in. sewer pipe.

... GREAT BRITAIN ...

... Germany may import steel ... Russia trying to buy armaments in U. S.

LONDON, Jan. 24 (By Cable)—A big speed-up of sheet mills is certain following the Government air raid shelter orders. Many plants are now assured full time work for three months. Further orders are likely in the near future, making a probable total of a million tons of steel. In other respects the market is dull. The anticipated new year revival has not materialized.

The export market in pig iron is idle; export steel is restricted and the heavy plants are operating well below capacity.

The tin plate market is quiet. Unfilled orders amount to 2,000,000 base boxes with widespread deliveries.

The Continental steel market is well below the hopes for the new year. Belgium declined a 50,000-ton order from Japan owing to unsatisfactory payment conditions.

A cold rolled steel cartel was formed at a meeting on Jan. 20. The postponed International Thin Sheet Cartel meeting has now been fixed for Cologne on Feb. 7 and 8. The International Tube Cartel has been provisionally prolonged to the end of February to allow a settlement of the Czechoslovak question.

Germany plans a new bridge construction involving 750,000 tons of steel. German railways are to place orders for 780,000 tons of rails, 500

locomotives, several thousand coaches and wagons. German building schemes also involve large quantities of steel. The 10 per cent increase in German steel output is regarded as insufficient and imports are probable.

Russia is planning to place orders for \$15,000,000 worth of American armaments, but it is understood the United States Government has refused credits owing to disputes over war debts and indemnities on confiscated American properties.

CAST IRON PIPE

Miami, Fla., is considering extensions in pipe lines for water system, including two main feeder lines to Coconut Grove and point near N.W. Sixty-second Street, respectively, and installation of distributing lines in area of city not served at present time, totaling about 80 miles; also extensions and improvements in pumping stations and other waterworks structures. Cost about \$2,700,000. Financing will be arranged soon.

Troy, N. Y., plans pipe line extensions and improvements in water system, including new main feeder line from Quackenkill reservoir to city. Cost about \$200,000.

Wyandotte Township, Wyandotte County, Kan., care of Charles A. Haskins, Finance Building, Kansas City, Mo., consulting engineer, will take bids soon for 2 to 8-in. pipe for extensions in water system from present terminus to Edwardsville and Lake of the Forest, where service will be furnished in future.

Haw River, N. C., plans pipe lines for water system and other waterworks installation. Proposed to arrange financing in amount of \$75,000 for this and sewage system.

State Architect, Sacramento, Cal., asks bids until Jan. 31 for extensions and improvements in water system at institution at Eldridge, Cal., comprising about 17,500 ft. of ¾ to 8-in., with valves, fittings, etc.; also for deep-well turbine pumping unit and auxiliary equipment.

Anacortes, Wash., plans pipe line extensions in water system, including replacement of existing 6 and 8-in. feeder lines and other waterworks installation. Cost close to \$90,000. Financing in part is being arranged through Federal aid. T. G. McCrory is city engineer.

Covington, Ky., closes bids Jan. 31 for pipe and fittings for extensions in water system.

Newport, Ky., is considering pipe line replacements in several existing mains; also two new steam-driven pumping units and auxiliary equipment for waterworks pumping station. Cost close to \$100,000. Fosdick & Hilmer, Union Trust Building, Cincinnati, are consulting engineers.

Science Hill, Ky., asks bids until Jan. 31 for pipe lines for water system; also for 50,000-gal. elevated tank and tower and pumping equipment. Cost close to \$35,700. H. deB. Forbes, Richmond, Ky., is consulting engineer.

Tylertown, Miss., plans pipe line extensions and replacements in water system, now being acquired from private interests. Special election has been called Feb. 14 to approve bond issue of \$40,000 for entire project.

Prince Rupert, B. C., plans early purchase of pipe for replacement of several existing wooden mains. Cost estimated at \$40,000. F. N. Good, Town Hall, is town engineer.

Tacoma, Wash., has awarded 27,000 ft. of 4 to 20-in. pipe for water system to United States Pipe & Foundry Co., San Francisco, by Paine-Gallucci, Inc., Tacoma, contractor.

East Bay Municipal Water District, Oakland, Cal., has awarded 160 tons of 4-in. pipe to American Cast Iron Pipe Co., San Francisco, and 636 tons of 6-in. pipe to United States Pipe & Foundry Co., San Francisco.

... NON-FERROUS ...

... Non-ferrous demand remains dormant ... Lead down \$2 a ton ... Producers' copper price unchanged.

NEW YORK, Jan. 24.—Despite the closing down of several domestic mines and rumors of impending curtailment abroad, sentiment in the copper market in the past week was more bearish than it has been in a long time. The weakness which developed in securities' prices toward the close of the week was undoubtedly one of the major factors in creating this bearish sentiment. Further declines in the foreign price added to the precariousness of the domestic price structure. This morning's foreign price was in the neighborhood of 10.15c. per lb., c.i.f., or 10 points below the price of a week ago,

and business has been done in the open market at 10.375c. per lb., with indications that that level is not the bottom. Producers' prices, however, remain unchanged at 11.25c. per lb., Connecticut Valley. Faced with these confusing conditions, consumers are limiting purchases to supplies necessary to sustain current operations.

Tin

Capping a week of moderate buying both here and abroad, prices in London broke £2 over the week-end to level out at £213 15s on Monday. This unexpected development, attributed to general uneasiness over the

European situation, successfully stifled all interest here in the past two days. In keeping with sentiment in the other non-ferrous markets, Straits prices in New York declined from a high of 46.70c. per lb. on Wednesday to a low of 46.15c. on Monday.

Lead

An extended decline in the London price which has finally edged it below the theoretical import cost, together with the pressure of custom tonnages demanding attention, resulted in a \$2 per ton cut in lead prices today. The new price basis of 4.60c. per lb., St. Louis, is the lowest since June 30, 1938. The price reduction brought out better buying in some quarters this morning, but the past week as a whole was the poorest in several months. The week's sales totaled about 4000 tons, divided evenly between prompt and February. At the first session in London this morning, spot lead was quoted at 2.95c. per lb., as against 3c. a week ago.

Zinc

The market in the past week reflected conditions in the copper, lead and tin markets, with demand being very limited. The week's business amounted to only 1265 tons of prime Western spelter, as compared with 2259 tons in the previous week. Shipments, however, continue at a fairly even pace, the week's total of 3858 tons comparing with 3958 in the preceding week. Consumption, as indicated by galvanizing operations, is slowly improving, and in view of the decline in sales there appears to be building up a demand of sizable proportions which will probably be forced into the market within the next month. Domestic quotations, meanwhile, are unchanged at 4.89c. per lb., New York.

NON-FERROUS PRICES

Cents per lb. for early delivery

	Jan. 18	Jan. 19	Jan. 20	Jan. 21	Jan. 23	Jan. 24
Copper, Electrolytic ¹	11.25	11.25	11.25	11.25	11.25	11.25
Copper, Lake	11.375	11.375	11.375	11.375	11.375	11.375
Tin, Straits, New York	46.70	46.55	46.50	46.15	46.25
Zinc, East St. Louis ²	4.50	4.50	4.50	4.50	4.50	4.50
Lead, St. Louis ³	4.70	4.70	4.70	4.70	4.70	4.60

¹ Delivered Conn. Valley, deduct ¼c. for New York delivery. ² Add 0.39c. for New York delivery. ³ Add 0.15c. for New York delivery.

Warehouse Prices

Base per lb., Delivered

	New York	Cleveland
Tin, Straits pig	47.375c.	49.75c.
Copper, Lake	12.25c.	12.375c.
Copper, electro	11.50c.	12.375c.
Copper, castings	11.25c.	11.875c.
*Copper sheets, hot-rolled	19.375c.	19.375c.
*High brass sheets	17.31c.	17.31c.
*Seamless brass tubes	20.06c.	20.06c.
*Seamless copper tubes	19.875c.	19.875c.
*Brass rods	12.62c.	12.62c.
Zinc slabs	6.25c.	7.25c.
Zinc sheets, No. 9 casks	10.50c.	12.10c.
Lead, American pig	5.50c.	5.50c.
Lead, bar	6.175c.	8.40c.
Lead, sheets, cut	8.00c.	8.00c.
Antimony, Asiatic	15.00c.	17.75c.
Alum., virgin, 99 per cent plus	22.50c.	22.50c.
Alum., No. 1 remelt, 98 to 99 per cent	19.50c.	19.50c.
Solder, ½ and ½	28.65c.	29.95c.
Babbitt metal, commercial grade	22.75c.	22.50c.

* These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 1/3; on brass sheets and rods, 40, and on brass and copper tubes, 25.

Old Metals Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	8.00c.	8.75c.
Copper, hvy. and wire	7.00c.	7.50c.
Copper, light and bottoms	6.25c.	6.50c.
Brass, heavy	4.25c.	4.75c.
Brass, light	3.375c.	4.125c.
Hvy. machine composition	6.125c.	7.625c.
No. 1 yel. brass turnings	4.125c.	4.625c.
No. 1 red brass or compos. turnings	5.875c.	6.50c.
Lead, heavy	3.625c.	4.50c.
Cast aluminum	7.00c.	8.25c.
Sheet aluminum	11.75c.	13.25c.
Zinc	2.25c.	3.50c.

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered; virgin 99 per cent plus, 20c.-21c. a lb.; No. 12 remelt, No. 2 standard, 19c.-19.50c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt, New York; Asiatic, 14c. a lb., f.o.b.; American, 11.75c. a lb. QUICK-SILVER, \$77 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 10.50c. a lb. lcl.

G-E Plans \$2,500,000

Building at Chicago

CHICAGO — Seventy-seven thousand sq. ft. of land has been purchased here for erection of a modern building for General Electric Co.'s Chicago headquarters, W. O. Batchelder, commercial vice-president, announced.

An expenditure of approximately \$2,500,000 is involved, of which about 20 per cent represents investment in land. Work will soon be started on the building which will provide space for the General Electric sales offices, warehouse and service shop; the General Electric Supply Corp.; R. Cooper, Jr., Inc.; and other associated interests.

IRON AND STEEL SCRAP

... Trading is quiet except for one large mill purchase
... Composite unchanged at \$15.

JAN. 24.—A purchase of over 25,000 tons of scrap, mostly No. 2 steel, by Republic Steel Corp. for its various mills was the outstanding event of the week. It represents the third large purchase by this consumer since early November. Except for advances in No. 2 steel and related items at BUFFALO and leading grades at YOUNGSTOWN, market reactions have been slight. Printed quotations at CLEVELAND are unaffected, and at CHICAGO, where 5000 tons were placed, the general tendency is downward as a result of decreasing operations in the district. Another deal of equal magnitude in the East disclosed last week was the purchase of New York's 6th Avenue "L" scrap by Bethlehem Steel Co. from Harris Structural Steel Co. Being a private transaction without benefit of brokers, its effect on market quotations was nil. Fairly active buying is going on in the PITTSBURGH area, but quoted prices are unchanged. With the quoted range on No. 1 steel unchanged also at both CHICAGO and PHILADELPHIA, the composite remains the same as last week's average of \$15.

Pittsburgh

The market undertone continues strong with fairly active transactions in No. 1 heavy melting within the present quoted range of \$15.50 to \$16 a ton, which again remains unchanged this week. A moderate sized tonnage of No. 1 heavy melting was sold into consumption at \$15.50. During the past week while other points in the district continue to pay \$16 a ton and better for the same grade. Railroad specialties are slightly stronger. Current market conditions suggest a fair balance between supply and demand, although substantial tonnages might result in higher prices. With supplies fairly tight in the East and with Youngstown brokers having sold No. 1 steel at \$16 a ton last week, the Pittsburgh district continues to feel the effects of these conditions.

Chicago

The scrap market here is quiet, with a few sales being made here and there which have no bearing upon the current quotation of \$14 flat for No. 1 steel. Some reductions in the list were made this week. With operations on the decline in some of the local mills, a rising market does not seem likely in the near future, taking into consideration the possibilities for increased steel business over the next two months.

Philadelphia

Since export has pretty well cleared this district of distress scrap, the market

as a whole is showing little reaction to the current period of inaction. Domestic mills see little improvement in open-hearth activity over the next month and for that reason are either not interested in new commitments or are holding shipments on old orders to a minimum. Exporters are handling one boat now, and several more will dock at Port Richmond within the fortnight. But these boats are taking small cargoes and there is no pressure for deliveries to the dock. Quotations as shown on the price page are judged as being representative of the market, although it has been weeks since many have received a legitimate test. Most quotations will likely hold unchanged until the picture of steel consumption shows additional clarification.

Youngstown

The sale of several thousand tons, mostly No. 2 steel, to Youngstown and Warren mills last week has strengthened the market here and created more of a shortage. Only around 2000 tons of No. 1 heavy melting were involved, at \$16. Very little scrap is moving, at least temporarily, due to contraction of mill schedules, but conditions are very firm.

Cleveland

Reflection of the strong situation in the Valley is noted here, but it is insufficient to warrant an advance in printed quotations yet. Some 15,000 tons were purchased last week for Valley mills, with about 5000 tons for Chicago, and Buffalo, each, and several thousand tons in the South. At Cleveland No. 1 heavy melting is scarce.

Buffalo

This week 3000 tons of No. 2 heavy melting steel was sold to a large consumer in the district at a price reported to be \$12 to \$12.50 a ton. The sale advances the price of this commodity 25c. a ton, along with new heavy bundled sheets, drop forge flashings, and No. 1 busheling. For the present No. 1 heavy melting steel continues at \$13.75 to \$14.25 a ton.

St. Louis

Current trading negligible, but mills are inquiring for large tonnages which would be closed if agreement on price could be reached. Offerings other than railroad have receded further, with movement from the country very light. Recent fairly large railroad lists have been readily absorbed, with small tonnages being laid down in commercial yards. Industries are taking in all scrap due on contracts. Decline in stock market has made for hesitancy in purchasing. The melt is holding up well, with increases noted at stove plants and jobbing foundries. Railroad lists: Chicago, Milwaukee & St. Paul, 1880 tons; Rock Island, 3030; Chicago, Burlington and Quincy, 2711.

Cincinnati

With mill buying only at need level, the old materials market is quiet. Recent purchases in the Valley at good prices, tend to strengthen the local list. Dealers' trades are not aggressive, but no material is being ignored.

Detroit

Inactivity continues to mark the Detroit scrap market and in the absence of good indicators, prices continue to move sideways. Some shipments were delayed when an out-of-town consumer reduced open-hearth operations early this week. Lack of buying by local consumers impressed an air of bearishness on local brokers, although ingot operations in this area continued near the high level that has prevailed since fall.

New York

With a steady flow of material for export, quietness prevails in the local market. Rumors of substantial Japanese purchases last week did not prove to be true, although it is expected that Japanese buying houses will enter the market by month end in line with the buying cycle established several months back. The 25,000 tons of scrap involved in the antiquated 6th Avenue "L" now undergoing demolition by the Harris Structural Steel Co. has been sold to the Bethlehem Steel Co., and is being shipped in large sections to several of the mills of the company. Work of demolition is progressing rapidly at three points. Other material on cars is also moving more freely into eastern Pennsylvania. Prices are nominally unchanged.

Boston

Because the freight rate from Boston to Youngstown is considerably higher than from Boston to Pittsburgh, the purchase of 25,000 to 30,000 tons of scrap by the Republic Steel Corp. at \$16 a ton has little or no bearing on this market. It may, however, have a sentimental effect on prices for Boston steel turnings and bundled skeleton at a subsequent date. The domestic scrap market continues quiet and without feature. On the other hand, the export market continues active. Two small barges were loaded in this territory the past week for shipment to New York against an export order, a rather unusual event.

Pittsburgh Traffic Club Dinner To Draw 2000

PITTSBURGH—More than 2000 industrial and transportation leaders throughout the country are expected to attend the 38th annual dinner of the Traffic Club of Pittsburgh here Jan. 27. Tom M. Girdler, chairman, Republic Steel Corp., will be toastmaster and C. Wayland Brooks, Chicago attorney, will be the keynote speaker. Clifton C. Gray, general freight agent, Western Maryland Railway, is president of the Traffic Club of Pittsburgh and will serve as chairman of the dinner.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$15.50 to \$16.00
Railroad hvy. mltng.	16.50 to 17.00
No. 2 hvy. mltng. steel.	14.25 to 14.75
Scrap rails	17.00 to 17.50
Rails 3 ft. and under.	17.50 to 18.00
Comp. sheet steel	15.50 to 16.00
Hand bundled sheets.	14.50 to 15.00
Hvy. steel axle turn.	14.00 to 14.50
Machine shop turn.	9.75 to 10.25
Short shov. turn.	10.50 to 11.00
Mixed bor. & turn.	8.25 to 8.75
Cast iron borings.	8.25 to 8.75
Cast iron carwheels.	15.00 to 15.50
Hvy. breakable cast.	12.50 to 13.00
No. 1 cupola cast.	15.25 to 15.75
RR. knuckles & cplrs.	17.00 to 17.50
Rail coil & leaf springs	17.50 to 18.00
Rolled steel wheels.	17.50 to 18.00
Low phos. billet crops.	18.50 to 19.00
Low phos. punchings.	17.50 to 18.00
Low phos. plate	17.00 to 17.50

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$15.00 to \$15.50
No. 2 hvy. mltng. steel.	13.50
Hydraulic bund., new.	14.50 to 15.00
Hydraulic bund., old.	11.50 to 12.00
Steel rails for rolling.	17.00 to 17.50
Cast iron carwheels.	16.50 to 17.00
Hvy. breakable cast.	16.00
No. 1 cast.	16.50 to 17.00
Stove plate (steel wks.)	13.00 to 13.50
Railroad malleable	15.50 to 16.00
Machine shop turn.	8.50 to 9.00
No. 1 blast furnace.	6.50 to 7.00
Cast borings	6.50 to 7.00
Heavy axle turnings.	10.00 to 10.50
No. 1 low phos. hvy.	17.00
Couplers & knuckles.	17.00
Rolled steel wheels.	17.00
Steel axles	21.50 to 22.00
Shafting	20.50 to 21.00
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire	11.00 to 11.50
Cast borings (chem.)	9.50 to 10.00

CHICAGO

Delivered to Chicago district consumers:

Per Gross Ton	
Hvy. mltng. steel	\$14.00
Auto. hvy. mltng. steel	
alloy free	\$12.00 to 12.50
No. 2 auto. steel	11.50 to 12.00
Shoveling steel	13.50 to 14.00
Factory bundles	12.50 to 13.00
Dealers' bundles	12.00 to 12.50
Drop forge flashings.	10.50 to 11.00
No. 1 busheling	12.00 to 12.50
No. 2 busheling	5.75 to 6.25
Rolled carwheels	15.00 to 15.50
Railroad tires, cut.	15.00 to 15.50
Railroad leaf springs.	15.25 to 15.75
Steel coup. & knuckles	15.00 to 15.50
Axle turnings	12.25 to 12.75
Coil springs	16.00 to 16.50
Axle turn. (elec.)	13.75 to 14.25
Low phos. punchings.	15.50 to 16.00
Low phos. plates 12 in. and under	15.00 to 15.50
Cast iron borings	5.25 to 5.75
Short shov. turn.	7.00 to 7.50
Machine shop turn.	7.00 to 7.50
Rerolling rails	17.00 to 17.50
Steel rails under 3 ft.	15.75 to 16.25
Steel rails under 2 ft.	16.25 to 16.75
Angle bars, steel	15.25 to 15.75
Cast iron carwheels	12.25 to 12.75
Railroad malleable	15.00 to 15.50
Agric. malleable	11.25 to 11.75

Per Net Ton

Iron car axles	18.50 to 19.00
Steel car axles	18.00 to 18.50
Locomotive tires	14.50 to 15.00
Pipes and flues	9.00 to 9.50
No. 1 machinery cast.	12.50 to 13.00
Clean auto. cast.	13.00 to 13.50
No. 1 railroad cast.	11.25 to 11.75
No. 1 agric. cast.	10.25 to 10.75
Stove plate	7.75 to 8.25
Grate bars	8.00 to 8.50
Brake shoes	9.25 to 9.75

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$15.50 to \$16.00
No. 2 hvy. mltng. steel.	14.50 to 15.00
Low phos. plate	16.00 to 16.50
No. 1 busheling	14.75 to 15.25
Hydraulic bundles	14.75 to 15.25
Machine shop turn.	9.75 to 10.25

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$14.00 to \$14.50
No. 2 hvy. mltng. steel.	13.50 to 14.00
Comp. sheet steel	13.50 to 14.00
Light bund. stampings	11.00 to 11.50
Drop forge flashings.	13.00 to 13.50
Machine shop turn.	7.00 to 7.50
Short shov. turn.	7.50 to 8.00
No. 1 busheling	13.00 to 13.50
Steel axle turnings.	11.00 to 11.50
Low phos. billet and bloom crops	18.00 to 18.50
Cast iron borings	7.75 to 8.25
Mixed bor. & turn.	7.75 to 8.25
No. 2 busheling	7.75 to 8.25
No. 1 cast	16.50 to 17.00
Railroad grate bars	9.50 to 10.00
Stove plate	10.00 to 10.50
Rails under 3 ft.	19.00 to 19.50
Rails for rolling	17.00 to 17.50
Railroad malleable	15.50 to 16.00
Cast iron carwheels	14.00 to 14.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$13.75 to \$14.25
No. 2 hvy. mltng. steel.	12.00 to 12.50
Scrap rails	15.00 to 15.50
New hvy. b'ndled sheets	12.00 to 12.50
Old hydrual. bundles.	10.75 to 11.25
Drop forge flashings.	12.00 to 12.50
No. 1 busheling	12.00 to 12.50
Hvy. axle turnings.	10.50 to 11.00
Machine shop turn.	6.75 to 7.25
Knuckles & couplers.	16.50 to 17.00
Coil & leaf springs	16.50 to 17.00
Rolled steel wheels.	16.00 to 16.50
Low phos. billet crops.	15.50 to 16.00
Shov. turnings	8.75 to 9.25
Mixed bor. & turn.	7.50 to 8.00
Cast iron borings	7.50 to 8.00
Steel car axles	16.50 to 17.00
No. 1 machinery cast.	15.50 to 16.00
No. 1 cupola cast.	14.50 to 15.00
Stove plate	13.00 to 13.50
Steel rails under 3 ft.	18.00 to 18.50
Cast iron carwheels.	13.50 to 14.00
Railroad malleable	15.00 to 15.50
Chemical borings	9.00 to 9.50

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting.	\$13.25 to \$13.75
No. 1 hvy. melting.	13.00 to 13.50
No. 2 hvy. melting.	12.00 to 12.50
No. 1 locomotive tires.	13.50 to 14.00
Misc. stand. sec. rails.	14.50 to 15.00
Railroad springs	15.50 to 16.00
Bundled sheets	7.50 to 8.00
No. 1 busheling	7.50 to 8.00
Cast. bor. & turn.	3.50 to 4.00
Machine shop turn.	3.50 to 4.00
Heavy turnings	9.50 to 10.00
Rails for rolling	17.50 to 18.00
Steel car axles	18.50 to 19.00
No. 1 RR. wrought.	10.50 to 11.00
No. 2 RR. wrought.	12.50 to 13.00
Steel rails under 3 ft.	16.25 to 16.75
Steel angle bars	14.50 to 15.00
Cast iron carwheels.	14.00 to 14.50
No. 1 machinery cast.	15.00 to 15.50
Railroad malleable	12.00 to 12.50
No. 1 railroad cast.	12.75 to 13.00
Stove plate	9.00 to 9.50
Grate bars	9.00 to 9.50
Brake shoes	10.75 to 11.25

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel.	\$11.50 to \$12.00
No. 2 hvy. mltng. steel.	9.25 to 9.75
Scrap rails for mltng.	15.25 to 15.75
Loose sheet clippings.	6.75 to 7.25
Hydrau. b'ndled sheets	11.00 to 11.50
Cast iron borings	3.50 to 4.00
Machine shop turn.	5.25 to 5.75
No. 1 busheling	8.00 to 8.50
No. 2 busheling	2.75 to 3.25
Rails for rolling	17.50 to 18.00
No. 1 locomotive tires.	14.25 to 14.75
Short rails	18.00 to 18.50
Cast iron carwheels.	12.75 to 13.25
No. 1 machinery cast.	13.50 to 14.00
No. 1 railroad cast.	12.75 to 13.25
Burnt cast	6.75 to 7.25
Stove plate	6.75 to 7.25
Agricul. malleable	11.75 to 12.25
Railroad malleable	14.25 to 14.75
Mixed hvy. cast.	10.50 to 11.00

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel.	\$12.50 to \$14.00
Scrap steel rails	14.50 to 15.00
Short shov. turnings.	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought	10.00
Rails for rolling	16.00 to 16.50
No. 1 cast.	14.50
Tramcar wheels	14.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. indus-trial steel	\$10.50 to \$11.00
No. 2 hvy. mltng. steel.	9.50 to 10.00
Borings and turnings.	5.75 to 6.25
Long turnings	5.50 to 6.00
Short shov. turnings.	6.00 to 6.50
No. 1 machinery cast.	12.25 to 12.75
Automotive cast	13.50 to 14.00
Hvy. breakable cast.	9.75 to 10.25
Hydraul. comp. sheets.	11.75 to 12.25
Stove plate	8.00 to 8.50
New factory bushel.	10.75 to 11.25
Sheet clippings	8.25 to 9.25
Flashings	9.50 to 10.00
Low phos. plate scrap	12.00 to 12.50

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel.	\$11.00
No. 2 hvy. mltng. steel.	9.50
Hvy. breakable cast.	\$11.50 to 12.00
No. 1 machinery cast.	11.50 to 12.00
No. 2 cast	9.50 to 10.00
Stove plate	9.50 to 10.00
Steel car axles	20.00 to 20.50
Shafting	15.50 to 16.00
No. 1 RR. wrought.	11.00 to 11.50
No. 1 wrought long.	9.50 to 10.00
Spec. iron & steel pipe	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Clean steel turnings*	4.00 to 4.50
Cast borings*	3.50 to 4.00
No. 1 blast furnace.	3.50 to 4.00
Cast borings (chem.)	9.50 to 10.00
Unprepared yard scrap	6.00 to 6.50
Light iron	3.00 to 3.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast†	\$13.50 to \$14.00
No. 2 cast†	10.50 to 11.00

* \$1.50 less for truck loads.
† Northern N. J. prices are \$2 to \$2.50 higher.

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	Nominal
Scrap rails	Nominal
No. 2 steel	Nominal
Breakable cast	\$10.50 to \$10.60
Machine shop turn.	3.38
Mixed bor. & turn.	2.00 to 2.25
Bun. skeleton long.	8.15
Shafting	15.50 to 15.65
Cast bor. chemical.	5.50 to 5.75

Per gross ton delivered consumers' yards:

Textile cast	\$13.50 to \$15.00
No. 1 machine cast.	13.50 to 15.00

PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$12.50 to \$14.00
No. 2 hvy. mltng. steel.	11.50 to 13.00

CANADA

Dealers' buying prices at their yards, per gross ton:

Toronto Montreal	
No. 1 hvy. mltng. steel.	\$9.50 \$9.00
No. 2 hvy. mltng. steel.	8.00 7.50
Mixed dealers steel.	7.00 6.50
Scrap pipe	5.50 5.00
Steel turnings	4.50 4.00
Cast borings	3.50 3.00
Machinery cast	15.00 14.00
Dealers cast	13.00 12.00
Stove plate	11.00 10.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges	
No. 1 hvy. mltng. steel.	\$12.50
No. 2 hvy. mltng. steel.	11.00
No. 2 cast	11.00
Stove plate	10.00

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel.	\$13.50 to \$14.00
No. 2 hvy. mltng. steel.	12.50 to 13.00
Rails (scrap)	14.00

Philadelphia, delivered alongside boats, Port Richmond

No. 1 hvy. mltng. steel.	\$14.50 to \$15.00
No. 2 hvy. mltng. steel.	13.50 to 14.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

(Prices are f.o.b. unless otherwise indicated)

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Re-rolling only). Prices delivered Detroit are \$2 higher. F.o.b. Duluth, billets only, \$2 higher.

Per Gross Ton
Re-rolling \$34.00
Forging quality 40.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton
Open hearth or bessemer \$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Per Lb.
Grooved, universal and sheared 1.90c.

Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton
Pittsburgh, Chicago or Cleveland \$43.00
Worcester, Mass. 45.00
Birmingham 43.00
San Francisco 52.00
Rods over 9/32 in. or 47/64 in., inclusive, \$5 a ton over base.

SOFT STEEL BARS

Base per Lb.

Pittsburgh, Chicago, Gary, Cleveland, Buffalo and Birmingham 2.25c.
Detroit, delivered 2.35c.
Duluth 2.35c.
Philadelphia, delivered 2.57c.
New York 2.59c.
On cars dock Gulf ports 2.60c.
On cars dock Pacific ports 2.85c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham 2.10c.
On cars dock Tex. Gulf ports 2.45c.
On cars dock Pacific ports 2.70c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Cleveland, Youngstown or Sparrows Pt. 1.90c. to 2.05c.
Detroit, delivered 2.00c. to 2.15c.
On cars dock Tex. Gulf ports 2.25c. to 2.40c.
On cars dock Pacific ports 2.50c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributors)

Pittsburgh, Chicago, Gary, Buffalo, Cleveland, Youngstown or Birmingham 1.75c. to 1.90c.
Detroit, delivered 1.85c. to 2.00c.
On cars dock Tex. Gulf ports 2.10c. to 2.25c.
On cars dock Pacific ports 2.35c.

Prices on reinforcing bars have been subject to concessions of \$3 a ton or more from above quotations.

IRON BARS

Chicago and Terre Haute 2.15c.
Pittsburgh (refined) 3.60c.

COLD FINISHED BARS AND SHAFTING*

Base per Lb.

Pittsburgh, Buffalo, Cleveland, Chicago and Gary 2.70c.
Detroit 2.75c.

*In quantities of 10,000 to 19,999 lb.

PLATES

Base per Lb.

Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont, Del. 2.10c.
Philadelphia, del'd 2.15c.
New York, del'd 2.29c.
On cars dock Gulf ports 2.45c.
On cars dock Pacific ports 2.60c.
Wrought iron plates, P'tg. 3.80c.

FLOOR PLATES

Pittsburgh or Chicago 3.35c.
New York, del'd 3.71c.
On cars dock Gulf ports 3.70c.
On cars dock Pacific ports 3.95c.

STRUCTURAL SHAPES

Base per Lb.

Pittsburgh, Chicago, Gary, Buffalo, Bethlehem or Birmingham 2.10c.
Philadelphia, del'd 2.215c.
New York, del'd 2.27c.
On cars dock Gulf ports 2.45c.
On cars dock Pacific ports 2.70c.

STEEL SHEET PILING

Base per Lb.

Pittsburgh, Chicago or Buffalo 2.40c.
On cars dock Gulf ports 2.85c.
On cars dock Pacific ports 2.90c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton \$40.00
Angle bars, per 100 lb. 2.70

F.o.b. Basing Points

Light rails (from billets) per gross ton \$40.00
Light rails (from rail steel) per gross ton 39.00

Base per Lb.

Cut spikes 3.00c.
Screw spikes 4.55c.
Tie plates, steel 2.15c.
Tie plates, Pacific Coast ports 2.25c.
Track bolts, to steam railroads 4.15c.
Track bolts to jobbers, all sizes (per 100 counts) 65-5
Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS

Hot Rolled

Base per Lb.

Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown or Chicago 2.15c.
Detroit, delivered 2.25c.
Philadelphia, delivered 2.32c.
Granite City 2.25c.
On cars dock Pacific ports 2.65c.
Wrought iron, Pittsburgh 4.25c.

Cold Rolled*

Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown or Chicago 3.20c.
Detroit, delivered 3.30c.
Granite City 3.30c.
Philadelphia, delivered 3.52c.
On cars dock Pacific ports 3.90c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

Galvanized Sheets, 24 Gage

Pittsburgh, Chicago, Gary, Sparrows Point, Buffalo, Middletown, Youngstown or Birmingham 3.50c.
Philadelphia, del'd 3.67c.
Granite City 3.60c.
On cars dock Pacific ports 4.00c.
Wrought iron Pittsburgh 6.10c.

Electrical Sheets

(F.o.b. Pittsburgh)

Base per Lb.

Field grade 3.20c.
Armature 3.55c.
Electrical 4.05c.
Special Motor 4.95c.
Special Dynamo 5.65c.
Transformer 6.15c.
Transformer Special 7.15c.
Transformer Extra Special 7.65c.

Silicon Strip in coils—Sheet price plus sheet extra width extra plus 25c. per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

Long Ternes

No. 24 unassorted 8-lb. coating f.o.b. Pittsburgh or Gary 3.95c.
F.o.b. cars dock Pacific ports 4.65c.

Vitreous Enameling Stock, 20 Gage*

Pittsburgh, Chicago, Gary, Youngstown, Middletown or Cleveland 3.35c.
Detroit, del'd 3.45c.
Granite City 3.45c.
On cars dock Pacific ports 3.95c.

TIN MILL PRODUCTS

*Tin Plate

Per Base Box

Standard cokes, Pittsburgh, Chicago and Gary \$5.00
Standard cokes, Granite City 5.10

* Prices effective Nov. 10 on shipments through first quarter of 1939.

Special Coated Manufacturing Ternes

Per Base Box

Granite City \$4.40
Pittsburgh or Gary 4.30

Roofing Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)
8-lb. coating I.C. \$12.00
15-lb. coating I.C. 14.00
20-lb. coating I.C. 15.00
25-lb. coating I.C. 16.00
30-lb. coating I.C. 17.25
40-lb. coating I.C. 19.50

Black Plate, 29 gage and lighter

Pittsburgh, Chicago and Gary 3.05c.
Granite City 3.15c.
On cars dock Pacific ports, boxed 4.00c.

HOT ROLLED STRIP

(Widths up to 12 in.)

Base per Lb.

Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown or Birmingham 2.15c.
Detroit, delivered 2.25c.

Cooperage Stock

Pittsburgh & Chicago 2.35c.

COLD ROLLED STRIP*

Base per Lb.

Pittsburgh, Youngstown or Cleveland 2.95c.
Chicago 3.05c.
Detroit, delivered 3.05c.
Worcester 3.15c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

Pittsburgh, Youngstown, or Cleveland 3.10c.
Detroit, delivered 3.20c.
Worcester 3.50c.

COLD ROLLED SPRING STEEL

Pittsburgh

and

Cleveland Worcester

Carbon 0.26-0.50% 2.95c. 3.15c.
Carbon .51-.75 4.30c. 4.50c.
Carbon .76-1.00 6.15c. 6.35c.
Carbon 1.01 to 1.25 8.35c. 8.55c.

WIRE PRODUCTS

Carload lots, f.o.b. Pittsburgh, Chicago, Cleveland and Birmingham)

To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Galvanized wire, base	2.65c.*
Spring wire	3.20c.

* On galvanizing wire to manufacturing trade, size and galvanizing extras are charged, the price Nos. 6 to 9 gage, inclusive, thus being 3.15c.

To the Trade

	Base per Keg
Standard wire nails	\$2.15
Coated nails	2.45
Cut nails, carloads	3.60

Base per 100 Lb.

Annealed fence wire	\$2.95
Galvanized fence wire	3.35
Polished staples	3.15
Galvanized staples	3.40
Twisted barbed wire	3.20
Woven wire fence, base column	67
Single loop bale ties, base col.	56
Stand. 2 pt., 12.5 gage barbed cattle wire, per 80 rod spool.	\$2.54

Note: Birmingham base same on above items, except spring wire.

Add \$4 a ton for Mobile, Ala.; \$5 for New Orleans; \$6 for Lake Charles to above bases, except on galvanized and annealed merchant fence wire, which are \$1 a ton additional in each case.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills
F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

In.	Steel Black Galv.	In.	Wrought Iron Black Galv.
1/4	56 36	1/4	56 36
1/2	59 43 1/2	1/2	59 43 1/2
3/4	63 1/2 54	3/4	63 1/2 54
1	66 1/2 58	1	66 1/2 58
1 1/4	68 1/2 60 1/2	1 1/4	68 1/2 60 1/2

Lap Weld

2	61 52 1/2	2	61 52 1/2
2 1/2	63 54 1/2	2 1/2	63 54 1/2
3 1/2	66 57 1/2	3 1/2	66 57 1/2
7	8.65 55 1/2	7	8.65 55 1/2
9	10.64 1/2 55	9	10.64 1/2 55
11	12.63 1/2 54	11	12.63 1/2 54

Butt weld, extra strong, plain ends

1/4	54 1/2 41 1/2	1/4	54 1/2 41 1/2
1/2	56 1/2 45 1/2	1/2	56 1/2 45 1/2
3/4	61 1/2 53 1/2	3/4	61 1/2 53 1/2
1	65 1/2 57 1/2	1	65 1/2 57 1/2
1 1/4	67 60	1 1/4	67 60

Lap weld, extra strong, plain ends

2	59 51 1/2	2	59 51 1/2
2 1/2	63 55 1/2	2 1/2	63 55 1/2
3 1/2	66 59	3 1/2	66 59
7	8.65 56	7	8.65 56
9	10.64 55	9	10.64 55
11	12.63 54	11	12.63 54

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher, on all butt weld 8 in. and smaller.

Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall.
(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Seamless Cold Drawn	Hot Rolled	Lap Weld Hot Rolled
1 in. o.d.	12 B.W.G. \$ 9.01	\$ 7.82
1 1/4 in. o.d.	12 B.W.G. 10.87	9.26
1 1/2 in. o.d.	12 B.W.G. 11.79	10.23	\$9.72
1 3/4 in. o.d.	12 B.W.G. 13.42	11.64	11.06
2 in. o.d.	12 B.W.G. 15.03	13.04	12.38
2 1/4 in. o.d.	12 B.W.G. 16.76	14.54	13.79
2 1/2 in. o.d.	12 B.W.G. 18.45	16.01	15.16
2 3/4 in. o.d.	12 B.W.G. 20.21	17.54	16.58
3 in. o.d.	12 B.W.G. 21.42	18.59	17.54
3 1/4 in. o.d.	12 B.W.G. 22.48	19.50	18.35
3 1/2 in. o.d.	11 B.W.G. 23.37	20.62	23.15
4 in. o.d.	10 B.W.G. 35.20	30.54	28.60
4 1/2 in. o.d.	10 B.W.G. 43.04	37.35	35.22
5 in. o.d.	9 B.W.G. 54.01	46.87	44.25
6 in. o.d.	7 B.W.G. 82.93	71.96	68.14

Extras for less carload quantities:

40,000 lb. or ft. over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%

10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

Per Net Ton

*6-in. and larger, del'd Chicago	\$51.00
6-in. and larger, del'd New York	49.00
*6-in. and larger, Birmingham	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	52.00
F.o.b. dock, Seattle	52.00
4-in. f.o.b. dock, San Francisco or Los Angeles	55.00
F.o.b. dock, Seattle	52.00

Class "A" and gas pipe, \$3 extra 4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$42, Birmingham, and \$50 delivered Chicago and 4-in. pipe, \$45, Birmingham, and \$54 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:	
1/2 in. & 6 in. and smaller	65, 5 and 5*
Larger and longer up to	
1 in.	60, 10 and 5*
1 1/2 in. and larger	60, 5 and 5*
Lag bolts	60, 10 and 5
Plow bolts, Nos. 1, 2, 3	
and 7	65, 5 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex. blank or tapped:	
1/2 in. and smaller	65 and 5
9/16 in. to 1 in. inclusive	60, 5 and 5
1 1/4 in. and larger	60 and 5

* Less carload lots and less than full container quantity. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-fin. hexagon nuts U.S.S. S.A.E. 1/2 in. and smaller

9/16 to 1 in. 60-10 65
1 1/4 in. and larger

In full container lots, 10 per cent additional discount.
Stove bolts in packages, nuts attached

Stove bolts in packages, with nuts separate

Stove bolts in bulk

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(1/2-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh, Cleveland

Chicago, Birmingham

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland,

Chicago, Birmingham

Cap and Set Screws

(Freight allowed to destination)

Per Cent Off List

Milled hexagon head, cap screws, 1 in. dia. and smaller	50 and 10
Milled square head set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread 1/4 in. and smaller	68 and 10
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	65 and 10
Upset set screws, cup and oval points	73 and 10
Milled studs	57 and 10

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs
F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, \$56.00 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base

Delivered, Detroit

S.A.E. Series

Numbers

200 (1/2% Nickel)

2100 (1 1/2% Nickel)	\$0.75
2300 (3 1/2% Nickel)	1.55
2500 (5% Nickel)	2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.85
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel - molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni.)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.40c. base per lb. Delivered Detroit, 3.50c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip ..	23.50c.	21.50c.
Cold-rolled strip ..	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars ..	18.50c.	19c.	22.50c.	27.50c.
Plates ..	21.50c.	22c.	25.50c.	30.50c.
Sheets ..	26.50c.	29c.	32.50c.	36.50c.
Hot Strip 17c.	17.50c.	23c.	28c.	
Cold stp. 22c.	22.50c.	28.50c.	36.50c.	

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher

British and Continental

BRITISH

Per Gross Ton

f.o.b. United Kingdom Ports

Ferromanganese, export	Nominal
Tin plate, per base box	20s. 3d.
Steel bars, open hearth	£10 8s.
Beams, open-hearth	£10 5s.
Channels, open-hearth ..	£10 5s.
Angles, open-hearth ..	£10
Black sheets, No. 24 gage ..	£13
Galvanized sheets, No. 24 gage ..	£15 15s.

CONTINENTAL

Per Gross Ton, Gold £, f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet bars	Nominal
Plate 1/4 in. and up	£5 7s.
Plate 3/16 in. and 5 mm.	£5 13s.
Sheet 1/4 in.	£5 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base ..	£5 12s.

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$22.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	\$22.00
Delivered Brooklyn	24.50
Delivered Newark or Jersey City	23.53
Delivered Philadelphia	22.84
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown ..	21.00
F.o.b. Buffalo	21.00
F.o.b. Detroit	21.00
Southern, delivered Cincinnati ..	21.06
Northern, delivered, Cincinnati ..	21.44
F.o.b. Duluth	21.50
F.o.b. Provo, Utah	19.00
Delivered, San Francisco, Los Angeles or Seattle	24.50
F.o.b. Birmingham*	17.38

* Delivered prices on southern iron for shipment to northern points are 35c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	\$22.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	21.50
F.o.b. Buffalo	20.00
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown ..	20.50
Delivered Philadelphia	22.34
Delivered Canton, Ohio	21.89
Delivered Mansfield, Ohio	22.44
F.o.b. Birmingham	16.00

Bessemer

F.o.b. Buffalo	\$22.00
F.o.b. Everett, Mass.	23.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	23.00
Delivered Newark or Jersey City	24.53
Erie, Pa., and Duluth	22.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown ..	21.50
F.o.b. Birmingham	22.00
Delivered Cincinnati	22.11
Delivered Canton, Ohio	22.89
Delivered Mansfield, Ohio	23.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	\$26.50
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Gray Forge

Valley or Pittsburgh furnace...	\$20.50
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Charcoal

Lake Superior furnace	\$25.00
Delivered Chicago	28.34

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	\$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	\$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.	
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Per Gross Ton

Domestic, 80% (carload)	\$80.00
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Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	\$28.00
Domestic, 26 to 28%	33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk)	\$69.50*
50% (ton lots in 50 gal. bbl.) ..	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.) ..	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50%	\$30.50
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For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2%, \$1 per ton additional. Phosphorus 0.75% or over, \$1 per ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50%	\$24.50
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For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon	\$83.00
2.50% carbon	88.00
2% carbon	93.00
1% carbon	103.00

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads...	\$1.75
Ferrotungsten, 100 lbs. and less	2.00
Ferrovandium, contract, per lb. contained V., delivered	\$2.70 to \$2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots.	\$2.25†
Ferrocobalttitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	\$142.50
Ferrocobalttitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	\$157.50
Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton	\$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, \$3 unitage, freight equalized with Nashville	\$75.00
Ferromolybdenum, per lb. Mo. f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo. f.o.b. furnace	80c.

*Spot prices are \$5 per ton higher
†Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	\$5.25
Old range, non-Bessemer, 51.50% ..	5.10
Messabi, Bessemer, 51.50%	5.10
Messabi, non-Bessemer, 51.50% ..	4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria	12c.
Iron, low phos., Swedish, average, 68½% iron	12c.
Iron, basic or foundry, Swedish, aver. 65% iron	11c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	31c.
Man., African, Indian, 44-48%	29c.
Man., African, Indian, 49-51%	31c.
Man., Brazilian, 46 to 48½%	28c.

Per Short Ton, Unit

Tungsten, Chinese, Wolframite, duty paid, delivered	\$19.50
Tungsten, domestic, scheelite delivered	\$18.00 to \$19.00
Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	\$15.00
Rhodesian, 45%	19.00
Rhodesian, 48%	23.00
Turkish, 48-49%	23.00
Turkish, 45-46%	19.00
Turkish, 40-44%	16.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%	\$24.00
48-49%	22.50

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	\$17.00 to \$18.00
Domestic, f.o.b. Ohio River landing barges	18.00
No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines	18.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	31.50

FUEL OIL

Per Gal.

No. 2, f.o.b., Bayonne	4.25c.
No. 6, f.o.b., Bayonne	2.26c.
No. 5 Bur. Stds., del'd Chicago.	3.25c.
No. 6 Bur. Stds., del'd Chicago.	2.75c.
No. 3 distillate, del'd Cleve'd ..	5.50c.
No. 4 industrial, del'd Cleve'd ..	5.25c.
No. 5 industrial, del'd Cleve'd ..	3.00c.
No. 6 industrial, del'd Cleve'd ..	2.75c.

COKE

Per Net Ton

Furnace, f.o.b. Connells-ville, Prompt	\$3.75
Foundry, f.o.b. Connells-ville, Prompt	\$4.75 to 5.50
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95
Foundry, by-product, delivered Cleveland ..	10.30
Foundry, by-product, delivered Cincinnati ..	9.75
Foundry, Birmingham ..	7.50
Foundry, by-product, del'd St. Louis industrial district	10.75 to 11.00
Foundry, from Birmingham, f.o.b. cars dock Pacific ports	14.75

FABRICATED STEEL

... Lettings slightly lower at 21,800 tons as against 22,400 tons last week . . . New projects advance to 28,510 tons from 13,550 tons a week ago . . . Plate awards call for 2175 tons.

NORTH ATLANTIC STATES AWARDS

- 5150 Tons, Maine-New Hampshire, Piscataqua River bridge, to Phoenix Bridge Co., Phoenixville, Pa.
- 1680 Tons, Rocky Hill, Conn., barracks, power house, etc., to Ingalls Iron Works Co., Birmingham; through F. H. McGraw & Co., Inc., Hartford.
- 490 Tons, Providence, R. I., police and fire headquarters, to James H. Tower Iron Works, Providence; through New England Concrete Co.
- 490 Tons, Queens, N. Y., highway bridge, Horace Harding Boulevard, to American Bridge Co., Pittsburgh.
- 335 Tons, Passaic County, N. J., three bridges, route 6, to American Bridge Co., Pittsburgh.
- 310 Tons, Syracuse, N. Y., housing project, to Empire Structural Sales, Inc., Syracuse; through W. L. Crow Construction Co.
- 270 Tons, Brooklyn, garage roof, Schaefer Brewing Co., to Bethlehem Steel Co., Bethlehem, Pa.
- 260 Tons, Wilkes-Barre, Pa., East End School, to Reading Metalcraft Co., Reading, Pa.; through Berwick Lumber Co.
- 200 Tons, New York, Our Lady of Rosary convent in Bronx, to Lehigh Structural Steel Co., Allentown, Pa.
- 175 Tons, Buffalo, Willert Park housing project, to Buffalo Structural Steel Co., Buffalo, through Fleisher Engineering & Construction Co., Buffalo.
- 150 Tons, North Merrick, N. Y., grade school, to Weatherly Steel Co., Weatherly, Pa.
- 145 Tons, Beaver, Pa., County Home infirmary, to Pittsburgh Bridge & Iron Co., Pittsburgh.
- 135 Tons, Bethesda, Md., National Institute of Health, to Barber & Ross, Washington.
- 120 Tons, Ambler, Pa., addition to high school, to Max Corchin, Philadelphia, through Rothschild Construction Co.
- 120 Tons, Wilmington, Del., Delaware Motor Sales Co. building, to Belmont Iron Works, Philadelphia.
- 120 Tons, Erdenheim, Pa., high school gymnasium, to Frank M. Weaver & Co., Lansdale, Pa.
- 105 Tons, Errol, N. H., bridge, to American Bridge Co., Pittsburgh.
- 105 Tons, Pittsburgh, field house, to Pittsburgh-Des Moines Steel Co., Pittsburgh.
- 100 Tons, Brimfield, Mass., Fenton bridge, to American Bridge Co., Pittsburgh.

THE SOUTH

- 904 Tons, George West, Tex., highway bridge, to Virginia Bridge Co., Roanoke, Va.
- 725 Tons, Columbia, S. C., State office building, to Southern Engineering Co., Charlotte, N. C.; through John C. Heslep.
- 360 Tons, Bradley-McMinn Counties, Tenn., bridge, to Nashville Bridge Co., Nashville, Tenn.; through Rea Construction Co.
- 325 Tons, San Antonio, Tex., alterations to Joske Brothers store, to Alamo Iron Works, San Antonio; through Walsh & Benney.
- 300 Tons, Rock Hill, S. C., finishing building, Rock Hill Printing Co., to Southern Engineering Co., Charlotte, N. C.; through A. K. Adams Co.
- 215 Tons, Alcorn County, Miss., bridge, to Virginia Bridge Co., Roanoke, Va.; through W. Z. Shay Contracting Co.
- 179 Tons, Ivydale, W. Va., West Virginia State bridge, to an unnamed fabricator; E. R. Mills, general contractor.

- 140 Tons, Bee County, Tex., bridge, to Mosher Steel Co., Dallas, through Cage Bros. and L. A. Turner, general contractors.

- 120 Tons, Quantico, Va., dispensary and barracks for Navy Department, to Fort Pitt Bridge Works Co., Pittsburgh.

CENTRAL STATES

- 1910 Tons, Indianapolis, stock pavilion, Indiana State Fair, to American Bridge Co.; through J. L. Simmons.
- 1450 Tons, Lafayette, Ind., Purdue University music hall, to American Bridge Co.; through George A. Fuller.
- 500 Tons, Chicago, hangar, to Bethlehem Steel Co., Bethlehem, Pa.
- 305 Tons, Minneapolis, Minn., women's dormitory, to Crown Iron Works Co., Minneapolis.
- 200 Tons, Waverly, Ohio, Scioto River overflow bridges, to an unnamed fabricator.
- 190 Tons, McHenry County, Ill., bridges, to Midland Structural Steel Co., Cicero, Ill.
- 164 Tons, South Bend, Ind., addition to power house, to Edwards Iron Works, South Bend; through Sollitt Construction Co., South Bend.
- 135 Tons, Detroit, switch house, sewage treatment plant, to Whitehead & Kales Co., Detroit.
- 110 Tons, Butlersville, Ind., recreation building, to Hetherington & Berner, Inc., Cleveland.
- 100 Tons, Cleveland, Eaton Mfg. Co. addition, to Fort Pitt Bridge Works Co., Massillon; through Albert M. Higley Co., Cleveland, general contractor.

WESTERN STATES

- 1300 Tons, Portland, Ore., four towers for Bonneville project, to Lehigh Structural Steel Co., Allentown, Pa.
- 535 Tons, Seattle, geodetic survey vessel, to Bethlehem Steel Co., Lake Washington Shipyards, contractor.
- 480 Tons, Bonneville, Ore., Bonneville project power house, to Bethlehem Steel Co., Portland; through L. H. Hoffman, Portland, contractor.
- 300 Tons, Los Angeles, sound stage, to Bethlehem Steel Co., Los Angeles.
- 244 Tons, Lane, Idaho, bridge and overcrossing, to Stupp Brothers Bridge & Iron Co., St. Louis; through Sather & Sons, Seattle, contractor (previously reported as Zane, Idaho, bridges).
- 225 Tons, Shelly, Idaho, State bridge over Snake River, to American Bridge Co., Pittsburgh.
- 120 Tons, Berkeley, Cal., university building, to Bethlehem Steel Co., San Francisco.

PENDING STRUCTURAL PROJECTS

NORTH ATLANTIC STATES

- 12,000 Tons, Havre de Grace, Md., highway bridge; bids on substructure within several weeks.
- 6000 Tons, Wawarsing, N. Y., contract 313, Delaware aqueduct; bids in.
- 860 Tons, Montgomery County, N. Y., highway project F.A.G.M. 8528; McLain Construction Corp., Buffalo, low bidder (previously reported).
- 564 Tons, Jersey City, Isolation Hospital, Lehigh Structural Steel Co., Allentown, Pa., low bidder.
- 525 Tons, New York, Cross Bay bridge toll structures for New York City Parkway Authorities.
- 500 Tons, St. Georges, Del.; bids in near future to War Department.
- 450 Tons, Washington, Gallinger Hospital heating plant.

- 365 Tons, Beaver County, Pa., State underpass.

- 250 Tons, Cate, N. Y., school.

- 225 Tons, New York, bracing for Cathedral of St. John the Divine.

- 221 Tons, Orange County, N. Y., including 78 tons mesh, highway project R.C. 2559, Lane Construction Corp., Meriden, Conn., low bidder (previously reported).

- 210 Tons, New York, Essex Street retail market; bids in.

- 200 Tons, New York, building, West 49th Street.

- 200 Tons, Newark, N. J., building for American Smelting & Refining Co.

- 175 Tons, Syracuse, N. Y., factory building for Kilian Mfg. Corp.

- 150 Tons, Brooklyn, garage for Ace Automobile Co.

- 150 Tons, Jamaica, N. Y., new stack building, Central Branch Library.

- 150 Tons, Montgomery County, Pa., reconstruction of bridge No. 10/75 for Reading Co.

CENTRAL STATES

- 3000 Tons, Grand Rapids, Mich., press and die shops for Fisher Body Division of General Motors Corp.

- 1000 Tons, Waterloo, Iowa, bridge; bids Jan. 31.

- 700 Tons, Toledo, Ohio, factory and office building for Toledo Scale Co.

- 250 Tons, Columbus, Ohio, Lazarus Co. warehouse; Frank Messer, Cincinnati, general contractor (previously reported).

- 200 Tons, Toledo, factory building for Toledo Scale Co.

- 175 Tons, Cleveland, factory and office building for Cleveland Pneumatic Tool Co.

- 150 Tons, Lake Zurich, Ill., State railroad bridge.

- 115 Tons, Cleveland, Cleveland Pneumatic Tool Co. addition; bids in.

WESTERN STATES

- 832 Tons, Turlock, Cal., overcrossing; new bids Feb. 8.

- 400 Tons, Greybull, Wyo., railroad overhead crossing.

- 150 Tons, Mare Island, Cal., warehouse; bids Jan. 27.

- 125 Tons, Odair, Wash., stop log guides, Grand Coulee Dam.

- 110 Tons, Crownover, Wash., Roza Dam gate hoists; bids Feb. 8.

- Unstated tonnage, Los Angeles, post office addition; bids Feb. 28.

- Unstated tonnage, Fresno, Cal., post office; bids Feb. 24.

FABRICATED PLATES

AWARDS

- 1100 Tons, Cincinnati, steel pipe for waterworks, to American Rolling Mill Co., Middletown, Ohio.
- 900 Tons, Corvallis, Ore., 16 and 20-in. pipe, to Beall Pipe & Tank Co., Portland; through Empire Construction Co., Portland, contractor.
- 175 Tons, Darien, Conn., 24-in. sewer pipe, to National Tube Co., Lorain, Ohio, through Cleverock, Inc.

PENDING PROJECTS

- Unstated tonnage, Polson, Mont., discharge pipes for Flathead River pumping plant; Western Pipe & Steel Co., San Francisco, low bidder f.o.b. plant.
- Unstated tonnage, Boulder City, Nev., turbine inlet pipes; Consolidated Steel Corp., Los Angeles, low bidder.

SHEET PILING

AWARDS

- 1500 Tons, Providence, R. I., bulkhead, to Carnegie-Illinois Steel Corp., Pittsburgh.
- 500 Tons, Belmar, N. J., Shark river bulkhead, to Bethlehem Steel Co., Bethlehem, Pa.
- 175 Tons, Providence, War Department, to Bethlehem Steel Co., Bethlehem.

PENDING PROJECTS

- 2600 Tons, Havre de Grace, Md., highway bridge; bids on substructure within several weeks.
- 600 Tons, Cleveland, Carter Road-West Third Street bridge; new bids Feb. 2.

PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

Refined Syrups & Sugars, Inc., 120 Wall Street, New York, affiliated with Suchar Process Corp., same address, has approved plans for expansion and improvements in mill at Yonkers, N. Y., formerly property of Spreckels Sugar Corp. Cost close to \$100,000 with equipment.

Babcock Machinery Co., 1475 Broadway, New York, woodworking machinery and parts, has leased two-story and basement building at 40-22 Twenty-third Street, Long Island City, for plant. An option has been taken for purchase later.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until Feb. 10 for 13,896 ft. of cable (Circular 149).

Celanese Corp. of America, Inc., 180 Madison Avenue, New York, manufacturer of cellulose rayon products, is asking bids on structural materials for initial units of new mill near Pearisburg, Va., where about 1200 acres was secured several months ago. Main structures will be each three stories, 270 x 452 ft., with auxiliary buildings. Work will include a power house, machine shop, pumping station and other mechanical departments. Erection is scheduled to begin early in spring. Initial plant will cost about \$5,000,000 and ultimate mill close to \$10,000,000.

Broadway Maintenance Corp., 47-47 Thirty-fifth Street, Long Island City, manufacturer of neon signs and furnishing lighting service in parts of Queens and Kings Boroughs, has leased one-story building at Thirty-sixth Street and Forty-eighth Avenue, about 10,000 sq. ft. floor space, in part for electric sign manufacture, with remainder of building for storage and distribution.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 3 for galvanized iron or steel wire rope clips (Schedule 5377) for Brooklyn, Sewall's Point and Puget Sound Navy yards; castings (Schedule 5413) for Brooklyn and Philadelphia yards; until Feb. 7, one bench-type lathe and spare parts (Schedule 5414), bench drill with equipment (Schedule 5418), watchmaker's lathe with motor (Schedule 5419), engine lathe and spare parts (Schedule 5420), all motor-driven, for Camden, N. J.

Constructing Quartermaster, Fort Hancock, N. J., asks bids until Jan. 30 for one bench saw, and combination jointer and planer (Circular 6171-9).

Benn Supply Co., 556-58 Montgomery Street, Jersey City, N. J., distributor in metropolitan area for Jones & Laughlin Steel Corp., has purchased former plant of American Musical Wire Co., 451 Communipaw Avenue, consisting of two-story structure, 73 x 108 ft., and will occupy at once for new steel products storage and distributing plant, including company offices.

Borough Council, Vineland, N. J., has let contract to J. D. Pasquale, Sixth Street, for addition to municipal electric power plant. Cost close to \$175,000 with equipment.

Henry G. Goetz and Henry F. Ruschmann, 10 Melville Place, Irvington, N. J., manufacturers of dies, photographic equipment, etc., have purchased a one-story building at 97 Newark Way, Maplewood, N. J., for plant.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 31 for 200 light-weight pneumatic drills and 200 sets of angle-drilling attachments (Schedule 5402) for Philadelphia Navy Yard.

Sun Oil Co., 1608 Walnut Street, Philadelphia, has approved plans for additional units at oil refineries at Marcus Hook, Pa., and Toledo, Ohio, including equipment. Cost about \$5,500,000 each. Company has disposed of a bond issue of \$12,000,000, proceeds to be used for purpose noted.

Commanding Officer, Ordnance Department,

Frankford Arsenal, Philadelphia, asks bids until Jan. 30 for one hydraulic shell-banding press for 5-in. shell (Circular 659), annealed 70/30 cartridge brass disks (Circular 649), 1,600,000 tension wire screws (Circular 648); until Jan. 31, four quills and 66 carbide boring tools (Circular 665), six bench-type concentricity and wobble gages (Circular 655), material and manufacture of components for percussion primers, including heads, firing plugs, battery cups, bodies, etc. (Circular 650).

Constructing Quartermaster, Fort DuPont, Del., asks bids until Feb. 1 for pipe hangers, manhole covers, etc. (Circular 6172-24).

◀ BUFFALO DISTRICT ▶

Eastman Kodak Co., Kodak Park, Rochester, N. Y., has let general contract to Ridge Construction Corp., Kodak Park, for one-story addition to building No. 6. Cost close to \$50,000 with equipment.

White Aircraft Co., Inc., Military Road, Tonawanda, N. Y., Donald G. White, president, manufacturer of amphibian airplanes, is negotiating for lease of part of new municipal airport on North Main Street Extension, Jamestown, N. Y., for establishment of plant for assembling purposes, parts to be secured under contract with outside sources. It is also proposed to operate an aviation school at same location.

Morristown Sulphite Mill, Morristown (St. Lawrence County), N. Y., manufacturer of sulphite pulp and paper products, is considering one-story addition. Cost over \$50,000 with equipment.

◀ NEW ENGLAND ▶

Monsanto Chemical Co., Chemical Lane, Everett, Mass., plans two-story and basement development. Cost over \$50,000 with equipment. Main offices are at St. Louis.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 3 for one metal-cutting hack saw (Schedule 5403); until Feb. 7, radial drilling machine (Schedule 5429), two plate bending rolls (Schedule 5430), all motor driven; four 1500-lb. drop forge hammers (Schedule 5431).

Public Buildings Department, City Hall Annex, Boston, James Mohar, superintendent of school buildings, has let general contract to John Bowen Co., 129 Newbury Street, for top-story addition to two-story trade school at 550 Park Street, Roxbury, 62 x 101 ft. Cost close to \$100,000 with equipment. Joseph J. Driscoll, 7 Water Street, is architect.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until Jan. 30 for one automatic, high-speed, single spindle screw machine (Circular 251), high-speed steel reamers, end mills, facing tools, counterbores, etc., about 80 items in all (Circular 256); until Jan. 31, one hydraulic vertical surface broaching machine with alternating double ram (Circular 250); until Feb. 6, one multiple spindle head drilling machine (Circular 248), one precision-type boring machine with fixtures and equipment (Circular 246), all motor-driven.

◀ WASHINGTON DIST. ▶

Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., asks bids until Feb. 7 for air cylinders, air line lubricators, air pressure-reducing valves and air strainers (Circular 224), air pressure-indicating gages, portable galvanometers, resistance boxes, etc. (Circular 225).

Gross Mechanical Laboratories, Inc., 1705 West Baltimore Street, Baltimore, manufacturer of automobile equipment, has approved plans for new one-story shop and laboratory at 1530 Russell Street. Cost close to \$45,000 with equipment.

Bureau of Yards and Docks, Navy Department, Washington, asks bids (no closing date stated) for condensers, condensate pumps, air ejectors and auxiliary equipment for Pearl Harbor Navy Yard, T. H. (Specifications 9072).

William Schluderberg-T. J. Kurdie Co., Baltimore and Eaton Streets, Baltimore, meat packer, has let general contract to E. Eyring & Sons So., 808 South Conkling Street, for one-story addition. Cost close to \$50,000 with equipment. Henschien, Everds & Crombie, 59 East Van Buren Street, Chicago, are architects and engineers.

General Purchasing Officer, Panama Canal, Washington, asks bids until Jan. 31 for steel rails, angle splice bars, splice bolts and nuts, steel machine bolts, carriage bolts, brass bolts, steel rivets, steel nuts, iron or steel plate washers, lever wires, duct rods, tank ball stems, expansion shields, pipe sleeves, 200,000 ft. of solid copper wire, 4000 ft. of copper cable and other equipment (Schedule 3417).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 31 for motor-driven centrifugal pumps (Schedule 5331), turbine-driven forced-draft blowers (Schedule 5052) for Eastern and Western navy yards; until Feb. 3, one three-spindle drilling machine with motor-spindle drive (Schedule 5408) for Washington yard; three bending rolls (Schedule 5394) for Norfolk yard; two tool-makers' precision lathes and attachments (Schedule 5400) for White Plains yard; one metal-cutting hack saw (Schedule 5404) for Portsmouth, N. H., yard; two hand turret lathes (Schedule 5411), two automatic horizontal plain milling machines and spare parts (Schedule 5406) for Alexandria, Va., yard, all motor-driven.

◀ SOUTH ATLANTIC ▶

Carolina Fuel & Transportation Corp., Sanford, N. C., care of Stuart, James & Cooke, 17 Battery Place, New York, consulting engineers, has acquired local properties of former Carolina Coal & By-products Co., comprising about 2500 acres of coal lands. Expansion and development will be carried out, including new mine buildings and installation of machinery, mechanical-handling and loading equipment, shops, power house and other facilities. Cost over \$85,000. W. H. Cralle, Fort Myers, Fla., is president.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 10 for one motor-driven milling machine (Schedule 5432) for Charleston, S. C., Navy yard.

◀ SOUTHWEST ▶

National Battery Co., 2315 Pine Street, St. Louis, manufacturer of electric storage batteries, has acquired about one acre-tract at East Point, near Atlanta, Ga., for new one-story branch plant. Cost over \$150,000 with equipment.

Board of Education, Springfield, Mo., asks bids until Feb. 15 for equipment for new two-story industrial arts building, 75 x 135 ft., now under construction. Fund of about \$110,000 has been arranged for building and equipment. William B. Ittner, Inc., 911 Locust Street, St. Louis, is architect.

Bethlehem Supply Co., National Bank of Tulsa Building, Tulsa, Okla., subsidiary of Bethlehem Steel Co., has plans for expansion and improvements in former local plants of International Supply Co., and Oklahoma Iron Works, Inc., East Archer Street, recently acquired, and will expend about \$600,000 in buildings and equipment, instead of smaller sum previously noted in these columns.

Gaylord Container Corp., 2820 South Eleventh Street, St. Louis, manufacturer of fiber and corrugated board boxes and containers, has leased five buildings at Second and Dorcas Streets, totaling close to 100,000 sq. ft. of floor space, and will modernize for new plant. Cost over \$85,000 with equipment.

Texas Co., Houston, Tex., plans new gas repressuring plant at oil wells in Lake Central-Salem district, Marion County, Ill., con-

prising main unit and auxiliary buildings. Cost close to \$100,000 with equipment.

Big Three Welding & Equipment Co., Inc., M. & M. Building, Houston, Tex., has let general contract to Austin Co., 105 North Greenwood Street, for one and two-story welding works, storage and distributing plant on Clinton Drive, 180 x 180 ft. Cost about \$70,000 with equipment.

City Council, Texarkana, Tex., plans new municipal electric power plant and distributing lines. Cost about \$545,000, of which \$300,000 will be secured through Federal aid.

◀ SOUTH CENTRAL ▶

Arkansas Fuel Oil Co., Abbeville, La., has secured permission to build a new bulk oil terminal on Vermilion River, and will begin work soon on construction of wharf, several one-story buildings, steel tank storage and distributing facilities, pumping station and other units. Cost over \$75,000 with equipment.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until Feb. 1 for intake gate for Hiwassee dam, and miscellaneous gate equipment.

Columbus Mining Co., Coombs, Ky., plans rebuilding tippie at local coal-mining properties recently destroyed by fire. Loss close to \$45,000 with equipment.

City Council, Clarksdale, Miss., asks bids until Feb. 2 for two new boiler units with accessories, stokers and auxiliaries for municipal electric power plant. Stevens & Johnson, Starkville, Miss., are consulting engineers.

United States Engineer Office, Vicksburg, Miss., asks bids until Jan. 30 for 34 cast iron meter weights, from 15 to 305 lb. each (Circular 159).

◀ OHIO AND INDIANA ▶

Dart Mfg. Co., 461 Eastmoor Boulevard, Columbus, Ohio, manufacturer of airplanes and parts, has let general contract to Gilmore-Carmichael-Olson Co., 1873 East Fifty-Fifth Street, Cleveland, for new plant about five miles from Sandusky, Ohio, comprising main one-story unit for parts production and assembling, and several auxiliary structures. Cost close to \$200,000 with equipment.

Standard Brewing Co., 5805 Train Avenue, Cleveland, has awarded general contract to Thomas Berry, 2126 Elbur Avenue, for four-story addition, 41 x 70 ft., in part for storage and distribution. Cost about \$100,000 with equipment. Julius C. Schultz, 1370 Main Street, Buffalo, N. Y., is architect and engineer.

Contracting Officer, Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Jan. 30 for 13 to 30 fuel pumps, servicing type (Circular 565), 261 punching machines and 187 punching machine heads (Circular 563), flexible conduit ferrules and flexible conduit nuts (Circular 558); until Jan. 31 for plugs, oil tank catches, clamp assemblies, oil tank sumps, oil tank flanges, hopper assemblies, oil distribution system tubes, valve assemblies and cock assemblies (Circular 578), propeller spinner adapter assemblies (Circular 574), galvanized pipe straps, conduit lock-nuts, conduit bushings, clamps, 7600 ft. of cable, 3850 ft. of galvanized conduit, galvanized conduit elbows, conduit connectors, lag screws, 150 ft. of flexsteel conduit, 8500 ft. of solid wire and other equipment (Circular 572).

Phillips Pump & Tank Co., 904 Evans Street, Cincinnati, will take bids soon on general contract for two-story addition. Cost over \$45,000 with equipment. J. C. Grunke-meyer and C. W. Sullivan, 3717 Eastern Avenue, are architects.

Board of Education, East Chicago, Ind., will soon begin superstructure for two-story and basement addition to Washington industrial school, for which general contract has been let to Charles B. Johnson & Sons, 6 North Michigan Avenue, Chicago. Installation will include a machine shop, welding, electrical, woodworking and printing shops, industrial

arts department and other mechanical shops. Cost about \$535,000 with equipment. Michael Bittner, 721 West Chicago Avenue, East Chicago, is architect.

◀ MICHIGAN DISTRICT ▶

Ford Motor Co., Dearborn, Mich., has let contract to Jerome A. Utley, 6031 Mansur Street, Detroit, for new hydroelectric power plant at Milford, Mich., for power service for branch plant at that place. Cost over \$200,000 with equipment. Shreve, Anderson & Walker, Marquette Building, Detroit, are architects.

Constructing Quartermaster, CCC, Fort Brady, Mich., asks bids until Jan. 30 for annealed wire, wood screws, pipe, stove pipe, flashlight batteries, etc. (Circular 4601-37).

Muskegon Hardware Co., Muskegon, Mich., has filed plans for one-story building for storage and distribution. Cost close to \$40,000 with equipment.

Consumers Power Co., Jackson, Mich., has arranged an appropriation of \$16,000,000 for expansion and improvements in power plants and system, including equipment installation and replacements, transmission and distributing lines, power substations, switching stations and other structures. Considerable part of fund will be used for extensions in lines for rural electrification lines.

◀ MIDDLE WEST ▶

Sundstrom Pressed Steel Co., 8030 South Chicago Avenue, Chicago, manufacturer of steel specialties, has asked bids on general contract for one-story addition. Cost close to \$40,000 with equipment. Kocher & Larson, 506 West Sixty-third Street, are architects.

Peoples Power Co., 1400 Fifth Avenue, Moline, Ill., plans expansion and improvements in steam-electric power plant at Rock Island, Ill., including new boiler units and auxiliary equipment. Cost close to \$300,000 with equipment.

Howard Aircraft Corp., 5301 West Sixty-fifth Street, Chicago, has arranged for stock issue to total about \$1,200,000, considerable part of fund to be used for expansion, construction and development.

Bureau of Reclamation, Denver, asks bids until Jan. 31 for top-seal radial gates and radial gate operating and control equipment for gravity main canal, Gila, Ariz., project (Specifications 1177-D).

Lake Shore Tire & Rubber Co., S.E. Twenty-fourth and Scott Streets, Des Moines, Iowa, automobile tires and tubes, has let general contract to Arthur H. Neumann & Brothers, Hubbell Building, for one-story addition, 204 x 305 ft. Cost over \$100,000 with equipment.

City Council, Melrose, Minn., has rejected bids recently received for extensions and improvements in municipal electric power plant, including diesel engine-generator unit to replace an existing steam engine and auxiliary equipment. Cost about \$53,000. Proposed to ask new bids soon. Ellerbe & Co., First National Bank Building, St. Paul, Minn., are consulting engineers.

Rath Packing Co., Waterloo, Iowa, meat packer, has approved plans for five-story addition, 40 x 50 ft., W. A. Klinger, Inc., War-nock Building, is contractor. Cost over \$65,000 with equipment.

United States Engineer Office, Federal Building, Milwaukee, asks bids until Jan. 30 for standard forged steel turnbuckles (Circular 124).

◀ PACIFIC COAST ▶

Holly Sugar Corp., Dyer Station, Santa Ana, Cal., has plans for one-story addition to beet sugar mill, for expansion in bulk raw material dumping plant. Cost about \$80,000, of which close to one-half will be expended for mechanical equipment. Main offices of company are at Colorado Springs, Colo.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Feb. 1 for superstructure for one-story assembly and re-

pair shop at naval air station, Alameda, Cal. (Specifications 9033); until Feb. 8, 34 ordnance buildings at naval ammunition depot, Hawthorne, Nev., including cranes and hoists, heating and distributing piping, and other equipment and facilities (Specifications 8966).

Regal Amber Brewing Co., 675 Treat Avenue, San Francisco, has approved plans for four-story addition for expansion in tank department and mechanical-bottling division. Cost about \$200,000 with equipment. Contract for foundations has been made to Mission Concrete Constructors, Inc., 272 Turk Street, and award for superstructure will be placed soon. Robert A. Hanson, 608 Indiana Street, is consulting engineer.

Peerless Pump Co., 1902 East Sixty-seventh Street, Los Angeles, manufacturer of pumping machinery and parts, has asked bids on general contract for one-story addition, 41 x 204 ft., to an existing factory at 301 East Avenue 26, to be occupied by company; also for one-story office addition, 40 x 50 ft., same location. Cost over \$50,000 with equipment. Grant & Bruner, Ferguson Building, are architects.

Bureau of Reclamation, Denver, asks bids until Jan. 30 for one full-revolving, convertible-type truck crane, with power shovel attachment, mounted on four-wheel drive heavy-duty truck, for handling materials at Shasta Dam, Kennett division, Central Valley project, Cal. (Specifications 1176-D).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 31 for oil purifiers and spare parts (Schedule 5349) for Puget Sound, Wash., and Eastern yards; until Feb. 10, one power-operated traveling bridge crane, traveling hoist type (Circular 5345); until Feb. 14, two electric-operated submersible portable pumping units, with spare parts, strainers and check valves (Schedule 5410) for Mare Island yard.

◀ FOREIGN ▶

Gypsum Lime & Alabastine Co., Paris, Ont., plans new plant unit at Beachville, near Paris, with kilns, storage and distributing division, and other production facilities. Cost about \$80,000 with equipment.

Hayes Engineering Co., Ltd., Liverpool, England, manufacturer of gasoline engines for airplanes, etc., has secured tract at Speke, near Liverpool, for new one-story plant for engine manufacture, including parts production and assembling, and for other engineering accessories. Cost over \$150,000 with equipment.

Broken Hill Associated Smelters Pty., Ltd., Sydney, New South Wales, Australia, plans expansion and improvements in plant at Port Pirie, South Australia, including machinery for lead recovery and other production. Cost close to \$1,000,000.

Fleet Aircraft, Ltd., Fort Erie, Ont., has let general contract to O. C. Teal, Fort Erie, for new plant for airplane parts production and assembling. Cost over \$150,000 with equipment. Company is arranging financing through sale of additional stock to total about \$450,000, part of proceeds to be used for purpose noted.

Germany Orders 500,000 Tons Of South African Ore

ACCORDING to the Dutch newspaper *Nieuwe Rotterdamsche Courant*, the German iron industry has placed an order for 500,000 tons of South African iron ore a year. The first shipments have already been made. Other new sources of German ore supply mentioned by the paper include Switzerland, and it is also stated that there has been an increased output from Austria.

THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

... Inquiries show an increase in volume in most districts ... Orders about holding former levels ... Arsenal and railroads issue lists.

Plentiful Inquiries Point To Large February Sales

CLEVELAND—Much of the strength exhibited last month, when foreign business held well and domestic orders crept up to a better balance, is being retained in the current month. Local inquiries continue plentiful, but closing them is difficult. From present indications, the Government program may move forward more quickly than expected. It is generally believed February will prove more active from the standpoint of orders on the domestic side.

Mid-West Dealers Report Quotations in Volume

CHICAGO—All Chicago machine tool sellers report that inquiries are numerous and that quotations are being made on a large amount of work. Orders are not frequently received, but neither are they scarce. Some machines have been purchased for cylinder block machining at Farmall works of International Harvester Co., and much more is yet to come. A Rockford machine tool builder is replacing much of his equipment that is over 10 years of age in an effort to obtain a more efficient set-up and lower production costs.

Inquiry Volume Jumps In Metropolitan Area

NEW YORK—All dealers report a large volume of inquiries received during the past week, with the volume of orders at a much lower level. Unless some unforeseen event should disturb business confidence, however, sales during coming months should be good. Most sellers look to a better volume than they had last year. Aside from the new inquiries, old quotations are being dug out of files and matters that were dead a few months back are on the active list once more. Recent inquiry indicates also a wider interest on the part of plants making general industrial products. As has been written many times, the business placed in recent months and, in fact, the past year has been coming from concerns with Army or Navy contracts or from the arsenals and Navy yards themselves. That such sources will make up the back-ground of 1939 business in this territory there is little doubt, but to this ordnance and aircraft needs will be added a substantial portion of machinery sales to general industry, it is predicted.

Cincinnati Builders Report Demand at Even Level

CINCINNATI—There was no relative change in the machinery market the past week, demand averaging about the same as in the preceding week. A slight improvement in milling machine demand offset a shrinkage in lathe and drill business. With heavy tools holding to an almost even keel, market fluctuations are shown in the lighter types. Orders for up to three milling or grinding units were reported from foreign sources, with a few scattered one or two unit domestic bookings. Lathe builders indicated the

Missouri-Pacific to Spend \$110,755 for Machinery

ST. LOUIS—The 1939 budget of the Missouri Pacific Railroad and its subsidiaries, as approved by the Federal Court at St. Louis, includes large sums for shop machinery and tools and road machinery.

For the parent company, the shop machinery and tool budget of \$110,755 includes the following:

St. Louis: three 400-amp. battery chargers, \$5000; 40-ton, hand-operated hydraulic press, \$260; engine lathe, \$480; 24-in. vertical boring mill, \$10,090.

DeSoto, Mo.: Yates-American or equal mortiser, 15 in. x 6 ft., \$10,910; 20-in. engine lathe, \$4570; single-spindle sensitive drill, capacity to $\frac{1}{2}$ in., \$550; heavy duty, single punch shear, 42-in. throat, \$4460.

North Little Rock, Ark.: 24-in. vertical boring mill, \$10,075; motor driven lathe, capacity 20 in. x 8 ft. between centers, \$3020; three Magnaflux inspection units, \$5000; tool and cutter grinder, \$2830; 10-ft. heavy duty cornice brake, \$390; 60-in. power squaring shear, \$1300; 50-ton, 18-in. stroke, hydraulic bushing press, \$1930; two 12- x 2-in., motor driven double grinder, \$500; endless abrasive band grinder, \$250; 10-ton jib crane and electric operated hoist, \$2970.

Coffeyville, Kan.: 26-in. crank shaper, \$4200.

Sedalia, Mo.: two Magnaflux inspection units, \$5000; 24-in. crank shaper, \$3070; one combination engine bolt squaring, pointing and centering machine, \$5190; combination twist drill grinder and pointer, \$680.

Kansas City, Mo.: 10-ton jib crane, \$2820; 10-ton electric hoist, \$570; 32-in. engine lathe, \$8720.

bulk of business from domestic sources, although one European interest was in the market for two crankshaft lathes. Market optimism is still high as inquiries are slightly greater than a month ago.

Detroit Machinery Buyers Still Marking Time

DETROIT—Machine tool activity continues to mark time with only a nominal volume of inquiries, largely for replacement of small items, in evidence so far.

Springfield Arsenal Inquires For Machinery

BOSTON—The United States Army Department, Springfield, Mass., armory is in the market for one 400-ton knuckle joint coining press, and one 800-ton; two motor driven milling machines; two duplex spline milling machines; three small motor driven automatic milling machines; one 36-in. hydraulic shaper; one motor driven drilling machine with multiple spindle head; one motor driven precision type boring machine with fixtures and equipment; and machines with broaching or milling equipment for special work.

Ossawatimie, Kan.: motor driven sensitive drill, \$550.

Holisington, Kan.: rebuild Morton 36-in. draw cut shaper, \$4240; air pump cylinder boring machine, \$3300; portable Magnaflux inspection unit, \$1980.

For the Missouri Pacific Co. in Nebraska, the budget includes for Omaha, one 20-in. engine lathe, \$3950.

For the Union Railway Co., the Memphis, Tenn., terminal, 400-amp. portable electric welding machine, \$900; 30-in. engine lathe, \$7440; 20-in. engine lathe, \$4580; two 100-ton air motor operated jacks, \$1100.

Gulf Coast Lines: 90-in. wheel lathe, \$35,890; turret lathe, \$4930; and Dequincy 30-in. face grinder, \$2600; at Kingsville, Tex.

International-Great Northern: 400-amp. welder, \$900; two 50-ton air jacks, \$700; four 100-ton air jacks, \$2200; two 400-amp. welding machines, \$1800.

The work equipment requirements for the parent company includes a 40-ton locomotive crane, 70-ft. boom, \$24,500; fit up 10 auxiliary water cars, \$12,000; fit up four double deck wheel cars using retired coal cars, \$4210. And miscellaneous equipment includes: St. Louis, industrial tractor, equipped with 6000-lb. capacity swing crane, \$4800; Poplar Bluff, Mo.: industrial tractor for gas-electric drive, \$5860; Cotter, Ark.: gas-electric drive tractor, \$5900.

Edge Moor Iron Works, Inc., 30 Rockefeller Plaza, New York, have appointed Cochrane Engineering Co., 53 West Jackson Boulevard, Chicago, as exclusive sales representative for the sale of fabricated vessels and chemical equipment. The Chicago office is under direction of H. J. Meier and Thomas Bishop and will serve the southern half of Illinois, the northern section of Indiana, most of Wisconsin, and the eastern half of Iowa.